





THE
RURAL ECONOMY
OF
YORKSHIRE.
VOL. I.

THE
RURAL ECONOMY
OF
YORKSHIRE.
COMPRIZING THE
Management of Landed Estates,
AND THE
PRESENT PRACTICE of HUSBANDRY
IN THE
AGRICULTURAL DISTRICTS
OF THAT COUNTY.

By Mr. MARSHALL.

IN TWO VOLUMES.

VOL. I.

L O N D O N :

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ADVERTISEMENT.

FROM NORFOLK, in November 1782 *, I passed thro' Lincolnshire into YORKSHIRE; my native county; —where I spent six months;—principally in observing and registering its RURAL ECONOMY :—a task I was better enabled to perform in so short a time, as my early youth was spent among it; and my acquaintance with its present practitioners of course extensive.

When I left the county, in May 1783, I considered myself possessed of materials sufficient for the purpose I *then* had in view. But on looking over my papers (after I had got the Norfolk Economy through the press) I found many additions wanting, to render my register fit for the *public* eye. I therefore paid this country a second visit, in March last (1787;) and have made a farther stay in it of nine months: during which time I
have

* See the Preface to the RURAL ECONOMY of NORFOLK.

ADVERTISEMENT.

have not only filled up the deficiencies I was aware of; but have received an influx of fresh information I did not expect.

It was my intention, when I came down into the county, to have made EXCURSIONS into its best-cultivated Districts; but having found, in the immediate environs of the STATION I have been led to fix in, full employment for the time appropriated at present to the county,—I am under the necessity of postponing the intended excursions. I postpone them, however, with less regret; as, in acquiring a general knowledge of the rural economy of the KINGDOM, the *primary* object is to obtain the *widely differing practices* of STATIONS chosen in DISTANT COUNTIES:—the *partial excellencies* of INTERMEDIATE DISTRICTS, howsoever desirable they may be, are objects of a *secondary* nature.

PICKERING, 21 December 1787.

Published March 1788.

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THE
RURAL ECONOMY
OF
YORKSHIRE.

I.

THE COUNTY.

YORKSHIRE has always been spoken of as the first Province of these kingdoms. If we consider its superior magnitude; the variety and strength of its natural features; the fertility of its soils; and the industry of its inhabitants; the abundance and copiousness of its rivers; the richness of the views on their banks; and the wildness of those which are found among its mountains;—it is well entitled to pre-eminence.

VOL. I.

B

Viewed

Viewed as a field of RURAL ECONOMY, it is divisible into MOUNTAIN, UPLAND, and VALE. The VALE OF YORK, falling gently from the banks of the Tees down to the conflux of the Trent and Humber, is Nature's grand division of the County into EAST and WEST YORKSHIRE.

WEST YORKSHIRE naturally subdivides into mountains, which I shall term the *Western Morelands*; into *Craven*, a fertile corner cut off from the county of Lancaster; and into a various *manufacturing District*: EAST YORKSHIRE into *Cleveland*; the *Eastern Morelands*; the *Vale of Pickering* and its surrounding banks; the *Wolds*; and *Holderness*.

The WESTERN MORELANDS are links of the extensive chain of mountains which rise with the Staffordshire Morelands, and continue through Derbyshire, Yorkshire, Westmoreland, and Cumberland, almost without interruption, to the Highlands of Scotland. These mountains are covered with heath: but the vallies which intersect them are cultivated. Wentley-dale, the largest of these vallies, is fertile; and abounds with romantic beauties.

CRAVEN

CRAVEN is well cultivated and rich in soil, but not uniformly so; its surface being broken: it is neither a valley, a vale, nor a plain; nor does it fall under the idea of a mountainous or an upland country. It is small, compared with the other Districts of West Yorkshire.

THE MANUFACTURING DISTRICT is strongly featured. The northern and western parts of it mix with barren mountains. The more southern and eastern limb,—a lovely declivity shelving gently into the Vale of York, is rich and highly cultivated; excepting the most southern extremity, which partakes of the sandy hills of Nottinghamshire; and excepting the mountains on its western margin, which assimilate with those of Derbyshire.

THE VALE OF YORK is various in fertility. The fens at its base, and a heathy plain, part of the ancient forest of Galtres, north-eastward of the city of York, are drawbacks upon its productiveness. In a general view, however, it has not, in this country, its equal.

The vales of Gloucester and Evesham are more fertile, but less extensive. The wide flat of country which lies between the hills of

Surrey and Kent and the Downs of Suffex, may vie with it in extent, but not in general fertility. If we estimate the Vale of York by the number and copiousness of its rivers, and by the richness of its marginal banks, it would perhaps be difficult, in any country, to equal it*.

* I am not singular in my opinion of this passage of country. MR. GILPIN, in his Observations on the Mountains and Lakes of Cumberland and Westmoreland, and on several other parts of England, speaking of a view from Hackfall near Rippon; a view which overlooks the *upper* part of this Vale; speaks of it as follows:

“ It is a circumstance of great advantage when you are carried to this grand exhibition (as you always should be) through the close lanes of the Rippon road. You have not the least intimation of a design upon you, nor any suggestion that you are on high grounds; till the folding-doors of the building at Mowbray Point being thrown open, you are struck with one of the grandest and most beautiful bursts of country that the imagination can form.

“ Your eye is first carried many fathoms precipitately down a bold woody steep to the river Ewer, which forms a large semicircular curve below; winding to the very foot of the precipice on which you stand. The trees of the precipice overhang the central part of the curve.

“ In other parts, too, the river is intercepted by woods; but enough of it is discovered to leave the eye
at

CLEVELAND is, in general appearance, a continuation and appendage of the Vale of York;

at no uncertainty in tracing its course. At the two opposite sides of the curve two promontories shoot into the river in contrast with each other: that on the right is woody, faced with rock, and crowned with a castle; that on the left rises smooth from the water, and is scattered over with a few clumps. The peninsular part, and the grounds also at some distance beyond the isthmus, consist of one entire woody scene; which advancing boldly to the front of the precipice, unites itself with it.

“ This woody scenery on the banks of the river may be called the first distance. Beyond this lies a rich extensive country—broken into large parts—decorated with all the objects, and diversified with all the tints of distant landscape; retiring from the eye scene after scene, till at length every vivid hue fading gradually away, and all distinction of parts being lost, the country imperceptibly melts into the horizon; except in some parts where the blue hills of Hambleton close the view.

“ Through the whole extent of this grand scene—this delightful gradation of light and colours, Nature has wrought with her broadest and freest pencil. The parts are ample; the composition perfectly correct. She hath admitted nothing disgusting, or even trivial. I scarce remember any where an extensive view so full of beauties and so free from faults. The fore-ground is as pleasing as the back-ground; which it never can be where plots of cultivation approach the eye. And it is rare to find so large an extent of near ground, covered

York; there being no other natural division between them than what is given by an unperceived elevation of surface. The waters of the Vale of York fall into the Ouse and Humber; those of Cleveland into the Tees, which divides it from the county of Durham.

The EASTERN MORELANDS appear as a detached mass of mountain broken off from the BRITISH ALPS, which have been mentioned. The north-west limb of this fragment is an abrupt broken precipice. At the top a barren heath. At the foot, the Vale of York and the fertile plains of Cleveland. From the brink of this giant preci-

by wood or other surface whose parts are alike grand and beautiful.

“The vale of which this view is composed hath not yet entirely lost its ancient name, the *Vale of Mowbray*; so called from Mowbray-castle, now no longer traced even in its ruins; but once supposed to be the capital mansion of these wide domains. This vale extends from York almost to the confines of Durham; is adorned by the Ouse and the Ewer, both considerable rivers; and is certainly one of the noblest tracts of country of the kind in England.”

The *lower* part of the VALE OF YORK is not included in this view. It is less picturesque than the upper part; but more diffuse; more fertile; and, in rivers, infinitely richer.

pice the Morelands dip gently southward to the Vale of Pickering; on whose verge rise abruptly a range of thin-soiled limestone heights; which, in a similar manner, shelve gently into the Vale; forming its northern margin.

The VALE OF PICKERING is a singular passage of country. A lake left dry by nature. A bason, formed by eminences on every side, save one narrow outlet of the waters collected within its area, and upon the adjacent hills. Nature, perhaps, never was so near forming a lake without finishing the design. A dam of inconsiderable length across the Derwent, near Malton, would deluge the entire Vale; and the first passage of the waters would, in all probability, be down the sea cliffs, which are its eastern extremity.

The WOLDS of Yorkshire appear as if, during some convulsion of nature, they had been severed (by the sea-like Humber and its broad rich banks) from those of Lincolnshire. In the present state of things they may be considered as the main link broken off from the chain of chalky hills which is

thrown irregularly over the more southern provinces. The Yorkshire Wolds are the downs of Surrey on a large scale. They are the most magnificent assemblage of chalky hills the island affords. The features are large. The surface billowy, but not broken; the swells resembling Biscayan waves half-pacified. The *ground* in general is peculiarly graceful: *Wood* and *water* would render it most beautiful. Water is forbidden. But wood may be had at will: and it is extraordinary that the spirit of planting should have broken out so late. Utility, as well as ornament, calls loudly for the obvious improvement.

HOLDERNESS, towards the Humber, is a low flat tract: the Fens of Lincolnshire on a reduced scale. But the upper margin, which forms the skirts of the Wold-hills, is a lovely line of country. On one hand a fertile plain, abounding with wood and water: on the other, dry airy downs rising with an easy ascent to the highest wold.

In RIVERS the county under survey is singularly happy. The HUMBER, which might well be styled the RIVER OF RIVERS,
bounds

bounds it on the south. The TEES forms its northern confine. The DON, the AIR, the WHARF, the OUSE, and the DERWENT rise in its mountains, and wind through its plains.

In a COMMERCIAL light these rivers are objects of the greatest use. The tide flows into the center of the county. Not only *Hull*, but *York*, *Tadcaster*, *Ferrybridge* and *Doncaster*, may be called INLAND PORTS. The Don is rendered navigable to *Rotherham*, *Sheffield*; the Air to *Leeds*, *Bradford*; the Calder to *Wakefield* and to near *Halifax*; the Ouse to *Burroughbridge*; the Derwent to *Malton*; the Hull to *Driffield*, at the foot of the Wolds; and the Tees to *Yarm*, on the borders of Cleveland, at the head of the Vale of York. If, with the natural advantages this county possesses in its rivers, we view those which are given it by its MINES of coals, allum, iron, lead, copper; and its MANUFACTURES of woollens and iron wares; commerce appears to be singularly indebted to it: while to the SEA-PORTS of *Whitby* and *Scarborough*—as nurseries of hardy seamen—the nation at large owe much.

But

But national policy and commerce make no part of the present design ; unless when they are intimately connected with RURAL ECONOMICS. It therefore remains to view the county as a SUBJECT of RURAL ECONOMY.

No country entirely mountainous, nor one which is disturbed by manufacture, can be a fit subject of study for rural knowledge. The WESTERN DIVISION of the county falls chiefly under one or other of these descriptions. There are no doubt lands in West Yorkshire which are highly cultivated ; especially about Doncaster, toward Ferrybridge ; a passage worth perusing. But if we attend to the EASTERN DIVISION, we shall find collected, within comprehensive limits, almost every description of country which is interesting in rural affairs. A rich, well cultivated plain ; a group of almost barren mountains, inviting objects of improvement ; a fertile vale, various in soil and cultivation ; with a tract of chalky downs, terminating in a rich marshland fenny country : including grass land of every class, and arable land of almost every description. It is the island in miniature.

Nor do these NATURAL ADVANTAGES alone render East Yorkshire a desirable object of study: the INDUSTRY OF ITS INHABITANTS makes them peculiarly attentive to MINUTIAL matters; while the SPIRIT OF IMPROVEMENT, which has lately diffused itself among all ranks of men, renders this District singularly eligible, as a field on which to trace the greater OUTLINES OF MANAGEMENT.

VALE

2.

VALE OF PICKERING.

THE SITUATION of this division of East Yorkshire has been already given. Its OUTLINE somewhat oval. The EXTENT of its larger diameter about thirty-five miles; its greatest width about twelve miles: including in its area, and the cultivated lands which hang upon its banks, and which as property belongs to it, about three hundred square miles, or 200,000 acres.

The feet of the marginal swells are studded with TOWNS and VILLAGES; which in some parts are not a mile asunder; but in others are farther distant, and less regular.

To these marginal TOWNSHIPS belong, generally, the lands of the Slope, with a portion of the area or bottom of the Vale; which, through this reason, is thinly inhabited. From the center westward a few villages are scattered; but from thence eastward, the entire area, one township excepted, is included within the townships of the margin.

The

Cleveland

Ingleby

The Sea

HAMBLEDON

Rills - Dale

S

N

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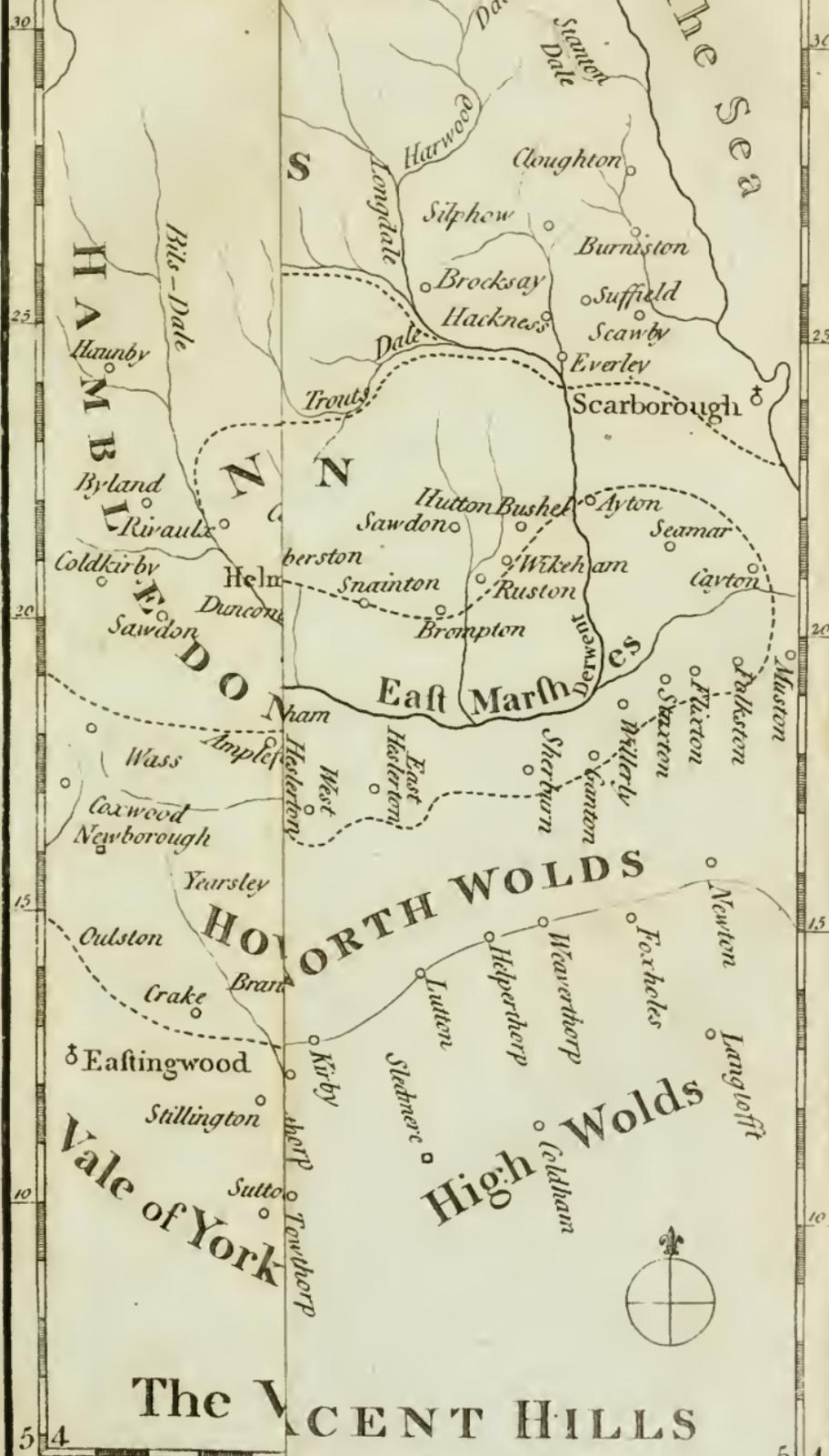
East Marshes

HOVORTH WOLDS

Vale of York

High Wolds

The VICENT HILLS



Cleveland

Ingleby

The Sea

HAMBLEDON

Rills - Dale

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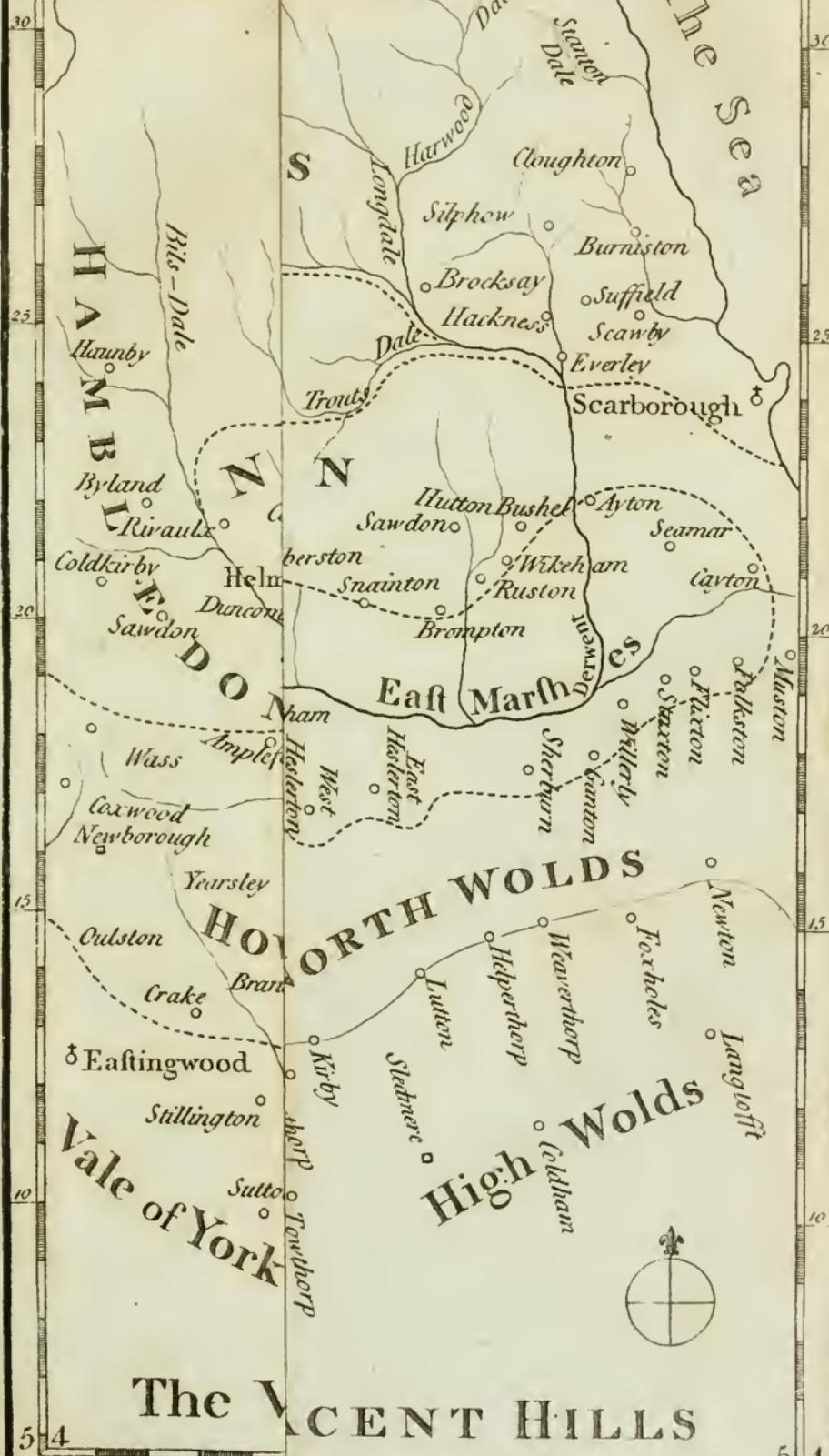
East Marshes

HOVORTH WOLDS

Vale of York

High Wolds

The VICENT HILLS



The AREA of the Vale is extremely flat ; nearly level ; but being broken by hillocks of different magnitudes, irregularly scattered ; and sometimes by promontories shooting from the marginal banks ; the eye can seldom judge either of its flatness or its extent.

These HILLOCKS and HEAD LANDS are invariably fertile ; mostly a fat clay : while the base on which they stand is either a rich sandy loam ; the common soil of the west end of the Vale ; or an inferior clay, interspersed with patches of moory soil ; the prevailing soils of the marshes and carrs of the eastern division.

The MARGINS are variously soiled. The skirts of the banks are mostly a rich middle loam ; dry, yet *cool* (how eligible for the sites of villages !) but generally decrease in quality with the rise of the hills which back them.

The WOLD HILLS, which on this side are bold but not broken, terminate at their summit in a thin chalky loam ;—the soil of Epsom and Banstead downs.

The

The range of hills which rise at Malton, and fill up the space between the wolds and the heights of Hambledon; which at present are without a name; but which I shall term the HOWARDIAN HILLS *; are lower and less abrupt; terminating in a various soil; covering a well-grounded, well-wooded, fine sporting country;—the inferior hills of Kent.

The NORTHERN MARGIN rises in general still less abruptly; terminating in a thin limestone loam, lying on a chain of heights, broken by wooded vallies, and backed by the moreland hills; which are intersected by cultivated “dales,” appendages of the “country” out of which they issue.

The CLIMATURE of the Vale is *above* the latitude it lies in (54°). The summer seasons are at least three weeks behind those of the southern provinces. What is remarkable, the seasons on the southern banks, about Malton, lying of course with a north aspect, are forwarder, by more than a week, than those

* CASTLE-HOWARD, the magnificent residence of HOWARD EARL of CARLISLE, is seated among these hillocks.

those of the northern margin, which lie full to the sun. The substratum of both is the same; namely Limestone Rock. The fact, perhaps, may be accounted for by the pile of mountains which rise behind the northern banks; and which, though they discharge rivers of water, still retain at their bases a sufficient quantity to keep their skirts cool through the summer-season.

The RIVERS of the Vale are the *Derwent* and the *Rye*; which, by receiving the waters of the *Costa*, the *Seven*, the *Dove*, the *Riccal*, and other inferior brooks*, is more copious than the *Derwent* at their conflux. The rivers have their rise in the moreland mountains, are collected in the dales, and wind through the wooded vallies into the area of the Vale; through which they move with sluggish pace to their narrow outlet.

As

* A remarkable circumstance attends these brooks; all of which, from the *Rye* to the *Costa* (the *Seven* in a dry summer not excepted) sink (when at dead water) in the vallies between the Limestone Heights. Some of them rise again in the same vallies in which they sink: others disappear entirely. In the time of floods they all occupy the channels which nature has provided for them on the surface; and which, in the annexed Sketch, are marked by dotted lines.

As a proof of the flatness of the Vale, the waters of the Rye are some four or five days in passing from Hemfley to Malton (about fourteen miles): and those of the Derwent, not less than a week in moving from Ayton (about fifteen miles) to the same general outlet. It is highly probable, that in a state of nature a principal part of the Vale was subject to be overflowed. Even now, since rivers have been cut, and embankments made, extensive fields of water are still to be seen in times of floods; not, however, through natural necessity, but for want of further exertions of art. By increasing embankments, and by removing obstructions natural and artificial*, the rivers, in their highest swell, might be kept within due bounds.

INLAND NAVIGATION. The Derwent is made navigable to Malton; and might, without extraordinary expence, be continued so to Ayton; and the Rye and its branches

* The cataract-like mill-dam across the Derwent at Old Malton is a public nuisance which reflects disgrace on every man of property in the Vale. It appears as if intended to finish what nature has left undone!

might

might, with little exertion of art, be made navigable to Pickering, to near Kirkby, and to Hemlsley. But a sequestered vale, without mines or manufactories *, and with two sea-ports in its neighbourhood, and an inland-port on its margin, requires no farther assistance from water carriage. A removal of the obstructions of the courses of the rivers is wanted here rather than more artificial ones.

INCLOSURES. A century ago, the marginal townships lay, perhaps, entirely open; and there are vestiges of common fields in the area of the Vale. The west marshes, church property, have been longer under inclosure; and the central townships were probably inclosed long before those of the margin; the soils of that part being adapted to grass; and while the surrounding country lay open, grass land was of singular value. At present, the entire Vale may be said to be in a state of INCLOSURE; a subject which will be spoken of fully in its proper place.

* Excepting a manufactory of coarse linen, which prevails, more or less, I believe, through the several districts of East Yorkshire.

PRODUCE: wood, grafs, and corn: the two latter at present intermixt, from the center of the area to the fummit of the marginal heights. The first, though abundant, being confined principally to the vallies of the margin, does not afford general ornament; nor even appear to the eye at a distance. On a near view, however, some of those vallies contain great beauties. The situation of Rivaulx, the site of a dilapidated monastery, would fatisfy the most craving eye. Were the extensive woodlands which these vallies contain scattered on the bosoms of the surrounding hills, the Vale of Pickering would be a passage of country as singular in point of beauty as it is in natural situation.

ESTATES

3.

ESTATES AND TENURES.

THE LANDS of the Vale are much in the hands of small owners. The only large estate which it contains lies on its western margin; and this for magnitude and intireness is exceeded by few estates in the kingdom. The towns of Hemsley and Kirbymoorside, with the villages in their neighbourhoods, and an immense tract of Moreland reaching to the verge of Cleveland, are included in the DUNCOMBE estate. The EARL OF SALISBURY has a considerable property scattered across the richer part of the Vale from Sinnington to Brawby: and there are some few other off estates of noblemen in different parts of the District.

The CROWN still retains, in right of the dutchy of Lancaster, some property in the ancient forest of Pickering; and the ARCHBISHOP OF YORK has a considerable estate in the marshes.

SIR WILLIAM ST. QUINTIN has a good property about his residence at Scampston, and some other Gentlemen have residences and property in the Vale.

But the major part of the lands of the District are the property, and, in general, are in the occupation of YEOMANRY; a circumstance this, which it would be difficult to equal in so large a District. The township of *Pickering* is a singular instance. It contains about three hundred freeholders, principally occupying their own small estates; many of which have fallen down, by lineal descent, from the original purchasers. No great man, nor scarcely an esquire, has yet been able to get a footing in the parish; or, if any one has, the custom of portioning younger sons and daughters by a division of lands, has reduced to its original atoms the estate which may have been accumulated. At present no man is owner of three hundred pounds a year landed estate lying within the township, although its rental, were it rack-rented, would not be less than six or seven thousand pounds.

The

The prevailing TENURE is *freehold*; which, however, is in many cases subjected to a small *free-rent*, reserved by the Crown, or the feudal lords of which it has been originally purchased. In Pickering, which is still held by the Crown as part of the dutchy of Lancaster, the free-rent of the township is 28 l. 13 s. which is received annually by the freeholders in rotation, and paid in part into the hands of the lessees of the Crown; the remainder, I understand, to the heirs of the late lord Feversham*.

The *copybold* tenure is less prevalent here than in some other Districts: nevertheless, it occurs in different parts of the Vale.

The west marshes are principally under *Bishops lease* for three lives.

An ancient PRIVILEGE, founded in convenience or a degree of necessity, and established in right by long custom, still remains evident in this District. This privilege, which is here termed a *windrake*, and which,

* Part of the township, it is said, having been given up in discharge of monies advanced the Crown by a citizen of London; who, in parcelling it out, has reserved a free-rent of 8 l. 2 s. 6 d.

probably, heretofore was granted, and may still be traceable, in different parts of the kingdom, gives the occupiers of one parish liberty to drive their cattle to water over the commons of another, which happen to lie between a messuage, hamlet, or village, and a brook or other convenient watering-place; with, however, a provision, that the cattle so watered shall not be suffered to "couch and layer" on the ground driven over. But this original stipulation having in some cases been neglected to be complied with, the windrake has in time grown into a right of commonage. An instance wherein such a right has been established will be mentioned under the article INCLOSURES.

GENERAL

4.

GENERAL MANAGEMENT
 OF
 ESTATES.

THE leading principles of management, here, differ widely from those which prevail in Norfolk *. Here tenants are in full possession of the farms they occupy ; which, until of late years, they have been led, by indulgent treatment, to consider as hereditary possessions, descending from father to son, through successive generations ; the insertion of their names in the rent-roll having been considered as a tenure, almost as permanent and safe as that given by a more formal admission in a copyhold court.

One of the first estates in the District afforded some years ago a striking instance of this indulgent treatment. In the early days

* See Rural Economy of Norfolk, Vol. I. p. 66.

of its late possessor, the tenants were not only suffered to *bequeath* their farms to their respective relations, but to *sell* the “goodwill” of them to strangers.

The effects of this perhaps unprecedented indulgence were these: the happiness of thousands of individuals;—a respectability of character of the source of so much benevolence; a retardation of improvements in husbandry; and, consequently, a loss of produce to the *present* community: this being one of the few instances I have met with, in which a lowness of rent has operated as a cause of indolence in the renter.

In the later part of life, this benevolent character, perceiving perhaps the evil effect of too great indulgence, or actuated by other motives, increased his rent-roll some 50 *per cent*. But still he preserved his respectability: for his farms were still moderately rented.

The present possessor has repeated the advance; but whether with equal propriety and equal credit, is a matter not necessary to be discussed in this place.

A similar

A similar conduct has taken place on another considerable estate in the Vale, and with similar effects. The first rise was moderate, and made with judgment; the last ill-judged and immoderate; intailing years of wretchedness on numbers who had hitherto partaken of the common comforts of life.

These, and other instances which have fallen within my own knowledge, are sufficient evidences of the folly of deranging an estate by excessive rents. Heretofore the tenants on the estates above-noticed not only *kept up* old erections in proper repair, but *renewed* with substantial buildings; and made other improvements upon their respective farms, with the spirit of owners; considering them in every respect as their own estates; under a confidence that no advantage would be taken of such improvements; but that they would remain with themselves, and descend to their families.—Now, necessary repairs are neglected, buildings suffered to diminish, and improvements in husbandry laid aside; *for all confidence is lost*: one rise has not been thought sufficient, and two may be thought too few. It is said, and I am afraid with truth,

truth, that the common good management of laying down lands with grafs-seeds has been dispensed with, “for fear the field “ should look green, and the rent of the farm “ be raised !” Be this as it may, it is abundantly evident that both extremes in the rate of rent are prejudicial to an estate ; and that in fixing a rental, as in all other human affairs, there is a happy medium, which, though often difficult to find, always deserves to be sedulously sought. No attention ought to be spared in endeavouring to ascertain the mean value of an estate to be raised ; for on this only the advance can be adjusted with propriety.

It is evidently a want of policy in the manager of an estate to do any act which forfeits the confidence of *tenants at will*. For in this case, confidence is the only tie between landlord and tenant ; and if a rise of rent be necessary, it should be made with judgment and moderation, and at one advance ; that the necessary confidence may not be shaken, and the estate thereby rendered liable to the waste of tenants at will driven to despair.

With

With a *lessee* the case is different : the lease is in this case the tie : the maintainance of buildings, the usage of lands, and the term of occupation are fixt ; and the responsibility of the tenant may, in this case, apologize for an excessive rent, though it will not always be found a guard against its evil effects. However, it may be fairly inferred, that an estate can with propriety be rented higher under lease than at will : and further, that leases, or a firm reliance in the tenants on the head and heart of their landlord, are absolutely necessary to improvements in Husbandry.

It is not my intention to draw general inferences, unless they result aptly from facts under observation ; and unless they tend to what appears to be an obvious improvement in the general management of the District under survey. Nor is it my intention to *dilate*, or even to *recommend*, unless when such improvements present themselves to my mind in strong colours.

It appears evidently that in the larger estates of this District, the tenants (entirely at will) have lost much of the confidence which ought to subsist between landlord and tenant ;
and

and it strikes me clearly that it would be good management on such estates to grant leases on the larger farms, and fix the smaller ones at such rents, and under such assurances, as will restore spirit and peace of mind to their occupiers.

The management of a landed estate is not a light matter ; the prosperity and happiness of the country it lies in are nearly connected with it. And no other apology, I flatter myself, will be required for publishing the foregoing facts and reflections, or for venturing to recommend an innovation which prudent management might have rendered unnecessary.

The particular departments of management which require to be spoken to under this head are,

- | | |
|---------------------------|--------------------|
| 1. Manor Courts. | 5. Covenants. |
| 2. The Purchase of Lands. | 7. Removals. |
| 3. Tenancy. | 8. Receiving. |
| 4. Term. | 9. Heads of Lease. |
| 5. Rent. | |

I. MANOR COURTS. These ancient sources of the law of villagers are still pretty generally

rally

rally kept open ; even in manors where neither copyhold nor free-rent tenants remain ; and where, of course, their legality is disputable. Nevertheless they have still their uses : the cleansing of rivulets and common sewers,—the repair of roads to grounds,—the sufficiency of ring-fences,—and the estimation of damages by impounded cattle,—the stocking of commons, and the removal of public nuisances,—are matters which frequently require the interposition of a jury ; who, in places where they are still impanelled, are considered not only as judges of the general welfare of the manor, but are frequently called in as arbiters of private differences : and who are so fit to settle village disputes as a jury of neighbours who have personal knowledge of the parties and the subject matter in dispute ?

In a manor where the lord has no interest in the well-ordering of the lands and the inhabitants it contains, it might seem unreasonable to oblige him to maintain a court at his own expence ; but if fines for non-appearance, and americiaments for defaults, could be legally recovered, the extra charge,
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if any, would be small, and might be borne by the county. And there appears to be no solid objection to a regulation, which would in the end be productive of public as well as private good : for whatever tends to the advancement of cultivation and the well-ordering of society, contributes to the virtue and prosperity of a nation.

II. PURCHASE OF LANDS. From the multiplicity of small estates in this District, frequent transfers of property take place ; a market for land is always open, and the fair market-price pretty accurately understood ; consequently the *fluctuating value of land* may here be observed to advantage.

Some years ago the price was extremely high ; forty or fifty years purchase upon a very high rent : lands not worth fifteen shillings an acre rent were sold for forty pounds purchase. This, however, was not uniform through the District : for at the time those extravagant prices were given in one part of the Vale, lands of twice the rental value to a farmer were sold in other parts of it at exactly the same value ; though the distance between them is only a few miles ; and in
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the same District similar land is not now worth thirty pounds.

The cause of this disparity is a proper subject of investigation. The situation in one case is dry, with good roads; in the other low, and the roads deep and dirty. *That* is chiefly in the hands of small owners—most of them monied men, and anxious to increase their *possessions*: *This* principally in the occupation of tenants. In *That* the rage of possession had broken loose, and ideal values had in consequence been fixed to the lands on sale; while the lands of *This* were *cut of fashion*, and of course neglected. A moveable commodity may be carried to the best market; but land can only be sold at what is esteemed the fair market-price in the place it happens to lie in.

Hence it seems to follow, that a person who wishes to purchase at a cheap market without regard to locality, should look for a neglected District, and endeavour to avoid the neighbourhood of small owners, and that inordinate lust of possession which is evidently epidemical, but not continual.

On the contrary, one who wants to sell should wait, if he can, until a *dear time* offer itself; or otherwise accept, perhaps to a disadvantage, the *fashionable price* of the day.

These inferences, however, are more strictly applicable to small than to large purchases.

The present medial price of land in this District is about thirty years purchase upon a fair rental value; but varies much with the circumstances it happens to be under.

III. TENANCY. Upon most of the larger estates *leases* are unknown; the farms have been let *at will*, and held as hereditary possessions through successive generations. But it has been already observed, that the basis on which this species of tenancy formerly rested, has of late years been sapped, and is no longer sufficiently secure either for landlord or tenant.

In the marshes, in which the Archbishop of York has considerable property, *leases for lives* is the ordinary tenancy; and there, it is observable, rapid improvements in husbandry have been made.

IV. TERM. Lime being the factitious manure of the District; and upon old-inclosed land, the principal means of improvement; it may seem that a short term would be here sufficient. But if it be considered that the nature of much of the land, and the established practice and produce of the country, require an alternacy of corn and pasture; *fourteen years* is a reasonable term: if the price of labour and produce could be fore-known, twenty-one years would, for the tenant, the estate, and the community, be more eligible.

V. RENT. Extremely high. In most parts of the Vale much higher than even in Norfolk. There are lands under the ordinary course of husbandry let to farmers at thirty to forty shillings an acre. In many parts of the kingdom the same lands would not let for two-thirds of the price.

These circumstances imply a goodness of land, and a superiority of management,—or improvidence on the part of the renter. The three may be concerned. The land is good, and the management, in one particular, excellent; and it is allowed, that to this piece

of management is principally owing the present high rate of rent.

Formerly it was the universal practice to plow with four oxen and two horses, together with a plowman and one or two assistants. This extravagant plow-team is now universally reduced to two horses and a plowman. It is at least remarked by men of observation and judgment, that without this saving in the mode of tillage, the present rents could not be borne.

It must be observed, however, that the lands let at the above extravagant rents lie in eligible situations, and are let in small parcels. The larger farms lie in general in less eligible situations; and there are few, if any, so high as twenty shillings an acre.

To speak of the medium rent of the District would be vague; the rate of rent is, or ought to be, proportioned to the quality of soils; and lands worth from a pound to a penny an acre may probably be found on the same farm.

This variation of soil enables the observant cultivator to make accurate distinctions in
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the expence of management and produce, and consequently in the rental values of lands of different qualities : and this may account in some measure for the extraordinary estimation in which good land is held in the District.

This distinction is in general too little attended to upon large estates, the number of acres being in general too much regarded, and the quality of the soil too little. Maps are convenient instruments in the hands of managers of estates ; but unless they shew with sufficient accuracy the quality and situation, as well as the quantity of the land they represent, they become dangerous guides in fixing a rental : an accurate valuation is much more estimable than a handsome plan. The art of surveying may be learnt in a school ; but the judgment requisite in the valuation of lands can only be obtained by great experience in the field, and by some considerable share of knowledge of the particular lands to be valued.

VI. COVENANTS. Under the old tenancy, *repairs* were done, and new erections made entirely by the tenants, landlord allowing timber ;

and on some extraordinary occasions, a sum certain towards the workmanship and the other materials.

Gates and *hedges* were entirely under the management of the tenant; landlord allowing timber for the gates and dead fences, as well as for *implements* used upon the farm; also hedging stuff and brushwood for *fuel*.

The management of the *land*, too, was left to the tenant, who plowed and cropt it in the same manner as he would in all probability have done had it been his own estate.

While the necessary confidence on the part of the tenants remained, these principles of management were abundantly sufficient. The tenants took care of the estate as their own; the landlord's only care being directed to the annual receipt of the rent. But finding the tenants alarmed, and some of them no doubt dissatisfied, with the recent additions of rent, it was thought prudent to introduce new regulations respecting timber and the management of lands. Woodlands have been inclosed, and woodwards appointed. The plow has been restrained, and particular crops prohibited.

While

While the advance of rent remained moderate, verbal orders were found sufficient. But it is not probable that tenants at will and at *rack-rent* will pay much attention to the interest of their landlords, when their own interest is no longer connected with it. It strikes me clearly that no *estate at will* can be safely *rack-rented*. Nothing but a legal agreement specifying covenants, and binding a responsible tenant, can guard against the effects of an excessive rent.

VII. REMOVALS. The *time* of the removal of tenants here is, invariably, old Lady-day.

By the custom of *this* country, tenants at will are allowed to clear the premises previous to the day of removal, of *hay, straw,* and *manure!* quitting the farm on that day, and leaving it entirely naked of every thing except the *wheat on the ground;* which at harvest he reaps, *and carries off!* paying only for the "on-stand," or rent of the land which the wheat has occupied *.

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* Barley sown before Ladyday, *on fallow,* is also the tenant's, paying the on-coming tenant for the on-stand only.

Fortunately, however, for all parties concerned, removals have, until very lately, been little practised in the Vale: for a worse time or a worse mode could scarcely be devised. Old Ladyday is the middle of spring feed-time;—stock are still in the house;—the hay and straw partly eaten, and in part to eat;—and at that time of the year the roads, having been soaked and cut up during winter, and stiffened by the winds of March, are in their very worst state. These are disadvantages to the outgoing tenant. The inconveniencies of an incoming tenant entering upon a farm destitute of manure, and materials to raise it from, need not be enumerated.

In *Cleveland*, the time of removal is much more judicious. The incoming tenant takes possession of the arable land at Candlemas,—of the pasture grounds at Ladyday, and of the mowing grounds at Mayday;—when the outgoing tenant quits every thing but the wheat.

These regulations are admirably adapted to REMOVALS IN SPRING, and render them more eligible in many respects than MICHAELMAS REMOVALS, even when tempered with
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the Norfolk regulations. *Old Michaelmas* throws wheat seed-time too backward, and the unthrashed corn incurs a long and frequently tedious connexion between outgoing and incoming tenant: besides, too, the hay, the turneps, the feedage of leys broken up, and of young clover after harvest, make a long account between them: whereas, in Cleveland, the wheat on the ground, and perhaps a little remaining hay, are the only things to be valued (or removed), and the remaining wheat in the barn (if any) the only thing the outgoing tenant leaves behind him. If the barns be cleared by *Mayday*, which in general they may be without impropriety, the connexion between the outgoing and the incoming tenant (or landlord) dissolves entirely on the day of removal; which, namely, *Old Mayday*, is an eligible season, and a leisure-time of the year.

The chief inconveniency attending this mode of removal is that of the incoming tenant (residing, perhaps, at a distance) putting in the spring crops. But there is no day in the year on which this disagreeable business can be done without inconveniency to

all parties; and all that can be done is to find out such days, and fix upon such regulations as will reduce the inconveniency within the narrowest bounds possible.

From the observations I have hitherto made, New Michaelmas with the Norfolk regulations, and Old Mayday with those of Cleveland, appear to be the most eligible seasons of removal.

VIII. RECEIVING. The *time* of receiving varies on different estates. On one, Candlemas for the Michaelmas rents, and Midsummer for those of Ladyday, are the established times; and were they adhered to, better days for the purpose need not be chosen; though in strict propriety the first of March and the first of June might be still better *. But to suit the conveniencies or the caprice of the receiver, the ordinary times are seldom adhered to, the tenants being left in a state of uncertainty as to the time of receipt; notices being sometimes given and countermanded repeatedly: a state of embarrassment this to the tenants which

* See NORF. ECON. MIN. 47.

implies

implies unpardonable management. On a large estate the days of audit should be as fixt and invariable as the days of entrance and removal; and nothing but extraordinary circumstances can warrant a deviation. Upon another estate, still more considerable than that above alluded to, the practice is to receive a few days after the rents become due; namely, about Ladyday and Michaelmas. Worse seasons would be difficult to fix upon; and the practice is the less excusable, as it is founded on the principle of narrow economy, not on that of necessity.

With respect to the *mode* of receiving, it is here reduced to the lowest degree of simplicity. The tenants not only repair and fence, but pay the land-tax of their respective farms, which they rent at a sum certain, subject to no deduction; consequently there are no accounts to be settled, nor any voucher to be examined.

On these simple principles of management, even the business of receiving (the almost only business on an estate thus managed) is made light; and little time being

lost

lost in *regaling*, dispatch follows of course. In Norfolk, where economy is studied with considerable attention, the "Audit Frolick" is always a gaudy day; but here thousands are received over bread and cheese, and tens of thousands without even a horn of small-beer to quench the thirst.

IX. FORMS OF LEASES. It has been observed, that the lease is a species of tenancy uncommon in this District: I know but of one estate on which it has been adopted; an off estate in the family of a Scotch nobleman. This estate is, I believe, principally under leases of fourteen years.

The form is not altogether excellent; but in some respects it is singular; and in others judicious. It exhibits the outline of management of that particular estate, and gives some idea of the rural economy of the District. There are clauses in it which many *good* tenants would object to; but there are others which are well adapted to the preservation of the estate, without appearing to be oppressive or disgraceful to the tenant.

Leases are annually becoming more and more necessary; and it is my intention to
adduce

adduce the forms of those of different Districts. The formation of a lease requires great circumspection. A collection of digested clauses will facilitate the task of drawing a new form, or improving an old one; and will at the same time exhibit in the most substantial form a *compendium* of the general management of estates in different parts of the kingdom.

LANDLORD AGREES to let;—certain specified premises;—from Ladyday;—for a rent agreed upon;—during fourteen years, “and thence from year to year so long as (both parties) shall please.”

Also to put the buildings in tenantable repair.

LANDLORD RESERVES all mines, quarries, and royalties; timbers, and timber-like trees, spires and other trees;—with power to search for cut down and carry away at seasonable times; together with full power of sporting, &c. &c. (Tenant being allowed such damages as two indifferent persons “of equal degree” shall determine.)

ALSO

ALSO a power to enter upon the premises from time to time, to view the repairs and the condition thereof.

TENANT AGREES to take;—and to pay, without deduction (except the land tax) half-yearly;—at Michaelmas: and Ladyday (or within twenty days, demand being duly made) under forfeiture of the lease.

ALSO to pay such assessments, and to perform such services, duties, and customs, as are or shall be incumbent on the premises.

ALSO to perform the customary leadings or boondays observed at the lord's principal mansion; ALSO "all other suits, services, duties, and customs of any kind which now are or shall at any time during this demise, be taxed, charged, or imposed!"

ALSO to observe all rules, orders, and bylaws of the courts leet and baron of the lord.

ALSO not to let, nor suffer any person whomsoever to occupy, the whole or any part of the premises, "other than him the said (tenant) his executors or administrators,

“strators, their or his wife or children;—or
 “a cow-gait to a cottager holding under the
 “lord;”—without special licence in writing.

ALSO to keep the buildings, fences, and watercourses in good repair; and to scour, yearly, such ditches and watercourses as landlord shall direct: provided the part so set out do not exceed one-sixth of the whole.

ALSO not to cut down, shred, top, or lop timber or other trees; but to defend from cattle all trees and hedges.

ALSO not to burn fern, nor furze for ashes for sale, without consent.

ALSO not to sow rape, hemp, flax, woad, weld, madder, or hops; nor more than a specified quantity of potatoes, without leave.

ALSO to hoe, properly, all lands sown with turnep seed, and “to dress and weed
 “them according to good husbandry,”—under the penalty of 10 s. an acre.

ALSO to spend on the premises all the grass, hay, and straw grown thereon.

ALSO not to sell nor carry off dung or other manure.

ALSO,

ALSO, not to stock the premises with rabbits.

ALSO, not to suffer pigs to go loose without being rung. But in all things to use the premises in a husband-like manner.

ALSO, to resort with his corn, grain, and grist to his lord's mill.

ALSO, to employ such mole-catchers and vermin-killers as landlord shall appoint or approve.

ALSO, not to obstruct workmen, nor game-keepers, &c. &c.

ALSO, not to sport, nor keep sporting dogs, &c. &c. without leave in writing.

ALSO, *in the last year*, not to sow more than one-fourth of the arable land with wheat.

ALSO, *in the last year*, to suffer oncoming tenant to enter after Michaelmas to scale and dress the grass lands,—and to plow the arable for fallow or for crops,—and to sow and harrow,—without hindrance.

ALSO, *at the determination* of the demise, “whether by surrender, forfeiture, or otherwise,” to leave the last year's manure, straw, dung, and compost.

ALSO, *to leave* in tenantable repair, and without waste or spoil, all the houses, buildings, fences,

fences, ditches, and banks ; AND to discharge all taxes and other outgoings due from the premises.

TENANT BINDS HIMSELF, &c. in a specified sum for the due performance of the several covenants.

TENANT TO BE ALLOWED (*by award of arbitrators*) for the wheat of the last year :—to be valued in August or September before it be cut :—deducting from the estimate value the rent of the land it may grow on, agreeably to a specified valuation.

ALSO, for the turnep fallow of the last year.

ALSO, for the hay and straw left unconsumed. AND for the manure of the last year ; TOGETHER WITH the use of such land as landlord shall appoint for the consumption of hay and straw, *after the expiration of the term*, until Mayday.

ALSO, *during the term*, to be allowed limestone for the use of the farm ; such limestone being raised by the landlord, tenant paying fourpence a waggon-load for raising them.

MUTUALLY AGREE that all unprovided-for disputes shall be settled by arbitration.

5.

INCLOSURES.

THERE has no doubt been a time (and not perhaps many centuries past) when the entire country lay open; when common fields, common meadows, common pastures, open woods, and extensive forests and wastes, were the only division of lands in this kingdom. Even the demesne lands of the feudal lords appear to have once lain open with the lands of their tenants.

FITZHERBERT, who wrote about two hundred and fifty years ago *, speaking of the herbage

* ANTHONY FITZHERBERT was Judge of the Court of Common Pleas in the reign of Henry VIII. Beside his *Natura Brevium*, Justice of Peace, and other works in the law, he left two on Rural Economy—the *BOKE OF HUSBANDRY* and the *BOKE OF SURVEYING*;—the first treatises probably which were written on the subject in the English language; and the best that were written for more than a century afterward. There has been some doubt about whether these two treatises were really written by *Judge Fitzherbert*; but I flatter myself I shall, in its proper place, be able to adduce sufficient evidence of their being his productions.

herbage of townships, says, “by that is to be
“ understood the common pasture of the
“ town whereupon the herdman keepeth the
“ tenant’s cattle; for it may be so good that
“ the tenants need not to have any several
“ pasture” [importing in this place stinted
pasture]; “but that their common pasture
“ should be able to find all their cattle, both
“ horses, mares; beasts, and sheep: and so
“ it was of old time, that all the lands, mea-
“ dows, and pastures lay open and unclosed.
“ And then was their tenements much better
“ and cheaper than they be now; for the
“ most part of the lords have enclosed their
“ demesne lands and meadows, and keep
“ them in severalty; so that their tenants
“ have no common with them therein.” In
this state the cultivated lands of the kingdom
appear to have lain in Fitzherbert’s day.
For in his last chapter, the subject of which
is, “How to make a township that is worth
“ twenty marks a-year worth twenty pounds
“ a-year,” he recommends inclosure;—not
as a known improvement to be persevered in,
but as a scheme eligible to be adopted.

In the present century, more especially within the last fifty years, inclosure has made a rapid progress; and its effects have in general, I believe, been equal to those foreseen by Fitzherbert. The garden is the highest state of cultivation; open fields and common pastures the lowest; separate inclosures a middle state which seems to be well adapted to the present population of this country.

Be this as it may, the spirit of inclosure continues to be such, that in half a century more an open field, or an undivided common may be rare, and the remembrance of them will of course soon wear away. This is therefore the proper time to register interesting facts relative to the subject, and *this* the proper place for adducing them.

In my own remembrance, more than half the Vale under observation lay open: now scarcely an open field or an undivided common remains. Besides, the largest parish in the Vale—one of the most extensive parishes in the kingdom—is now under inclosure; and the circumstances attending it are such as have seldom occurred: a suitable opportunity this for endeavouring to ascertain just ideas
of a

of a subject, which, though it has of late years been much agitated, appears to be, even yet, imperfectly understood.

In the beginning of the present century, the immediate township of PICKERING remained in its ancient uninclosed state.

Having been thought too large to be laid out conveniently as one township, it had been judiciously split into two divisions by a natural line, a considerable brook which runs through it.

On each side of the brook lay a suite of COMMON FIELDS; three in number; for the unvarying round of wheat, &c. beans, &c. fallow. These common fields were respectively divided into *oxgangs* evenly scattered over every field; so that each occupier might have an equal or similar share of good and bad, near and distant land; the houses being in this, as in every other common-field township, placed in the town. Each field consisted of twenty-two oxgangs; each of which, on one side of the township, contained twenty-four acres—on the other twelve acres: consequently the six fields contained 2,76 acres.

Each division had likewise its COMMON MEADOW.

Other portions of the township were laid out in STINTED PASTURES, wholly appendant to the common-field land; each oxgang of which having a right to a limited number of gaits for *cows* and *working oxen*.

The remainder of the township, containing many thousand acres, was COMMON.

During this century the common fields and common meadows have been gradually contracting by amicable *exchanges* and transfers, and are now in a manner wholly inclosed. The stinted pastures have, at different times, been inclosed "*by commission*;" namely, by the unanimous reference of the parties concerned, to certain arbitrators or commissioners appointed by themselves; without calling in the aid of parliament. The commons are now under inclosure, pursuant to a *bill* procured for that purpose.

This bill, and the circumstances attending the procurement of it, afford a striking picture of modern inclosures by act of parliament.

The lands to be appropriated in this case consisted of 3,700 acres of culturable soil, valued (by the commission under the inclosure)

sure) at 3s. to 50s. an acre rent; and of a still greater quantity of heathy barren land, reaching to the center of the morelands, valued (by the same) from below 3s. down to 3d. an acre. The quantity of oxgang or common-field land (as above ascertained) 2376 acres; and the number of ancient common-right houses, or sites of such houses, two hundred and sixty.

To those 2376 acres*, and these 260 houses or sites, the commons belonged; but in what proportion had not for ages perhaps been clearly understood. Within memory, it seems, an attempt was made to stint them; but the regulation lasted only one year. Before and since that time they have been, in the strictest sense of the word, *unstinted commons*, for all kinds of commonable stock; excepting sheep and working oxen; which last were, *by the by-laws of the township*, confined to the stinted pastures and the upland commons; and the former to the upland commons only.

It may be taken for granted, that the first mover to an inclosure is private interest, rather than public spirit. In the case of Pic-

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kering,

* Together with the meadow lands.

kering, the LAND-OWNERS in general were satisfied with the open state of the commons. Some of them who had inherited, or purchased, at an advanced price, lands which lay conveniently to the commons, were of course adverse to an inclosure; and the mere HOUSE-OWNERS were either apprehensive of the smallness of their claim, or their voices were too weak to be heard among those of the land-owners.

Under these circumstances the commons lay open, and would probably have continued in that state, had there been no other interest in the township than that of the owners of its LANDS and HOUSES.

But the *tithes* of three or four thousand acres of corn land was an object of too great magnitude to be overlooked by the lessee (for lives under the Dean of York); and, being seen, had charms in it too fascinating to be lost sight of.

Actuated thus powerfully, the *lessee of the tithes* applied to the LAND-OWNERS to join him in an application to parliament for an inclosure. The land-owners refused: their conduct, however, was impolitic and ill-judged;

judged; and a fair opportunity lost is not easily regained.

The lessee of the tithes acted under a restless impulse; and no matter the instruments he made use of, so they answered his purpose. He, therefore, applied to the HOUSE-OWNERS; who, seeing riches within their reach which till then they had never thought of, grew frantic with expectation.

A law-agent well suited to the design was pitched upon; and other agents, no less qualified, gave him their best assistance. An equal division of the commons among the houses only was the prize held out; and a bill, framed for the purpose of obtaining it, was sent up to Parliament.

A faint ill-conducted opposition was made by the land-owners; but a more powerful interest, well applied, having got there before them, their intentions of throwing out the bill were frustrated.

Parliament, however, seeing probably the iniquity of the bill, without being willing to enter into a minute investigation, or able at their distance to ascertain with conveniency sufficient facts, left a principal matter open to

a trial at law; namely, whether the commons should be divided among the houses only; or whether one moiety of them should remain with “the lands of the township, which, “upon the first of January 1784, belonged “to the owners of ancient common-right “messuages, cottages or sites.”

In consequence of this order of Parliament, the question was tried, on a feigned issue, at the assize for the county, in the summer of 1785.

The trial was conducted with the same exertions on the part of the promoters of the bill, and with the same tameness and ill-judged confidence on the part of its opposers, as had been evident in every stage of the business. These circumstances co-operating with the “uncertainty of the law,” a verdict was obtained in favour of the houses.

Thus, by *manœuvre*; without even the shadow of *right* being offered; the owner of a mere cottage without a garden-place, or of a heap of stones which had long lain as ruins, and who could have no rightful advantage whatever from the commons in their
open

open state, became entitled to an equal share, under the inclosure, with the largest land-owner; who, perhaps, previous to the passing of this law, occupied rightfully some hundred acres.

It is true, many poor families may gain a temporary relief by this *inequitable* transaction; and so far the bill may have operated beneficially. But it must be evident to those who have a knowledge of the township, and who think impartially on the subject, that they might with equal propriety have been relieved out of the inclosed lands, or the personal property of the land-owners; and it could not be the intention of Parliament to be instrumental in transferring the property of one man to another without a sufficient cause: we may therefore safely conclude, that Parliament either in this case were imposed upon, or judged erroneously; or that they are in want of some general principles of inclosure.

I shall not presume to dictate to Parliament; but as I have paid some attention to this important subject, and may not have another opportunity so suitable as the present
of

of speaking my sentiments upon it, I will here throw together the ideas which have struck me, as a ground-work for further argument.

It will be proper in the outset to take a view of the origin of commons, and the first laying out of townships.

Fitzherbert, whose opinion in this case is valuable, speaking of customary tenants, in his 13th chapter of Surveying, says, “ Customary tenants are those that hold their lands of their lord by copy of court-roll after the custom of the manor. And there be many tenants within the same manor that have no copies, and yet hold by like custom and service at the will of the lord: and in mine opinion, it began soon after the Conquest. When William Conqueror had conquered the realm, he rewarded all those that came with him, in his viage royal, according to their degree. And to honourable men he gave lordships, manors, lands, and tenements, with all the inhabitants, men and women, dwelling in the same, to do with them at their pleasure.” And in his 40th chapter, in which he proposes

poses to improve by inclosure, he says, “ It
 “ is undoubted, that to every township, that
 “ standeth in tillage in the plain country,
 “ there be arable lands to plow and sow, and
 “ leys to tie or tedder horses and mares
 “ upon, and common pasture to keep and
 “ pasture cattle, beasts, and sheep upon;
 “ and also meadow ground to get hay upon.”

In another part of the same treatise, chap-
 ter 4. “ Of foreign pastures that be com-
 “ mon,” he says, “ This is a dark letter to
 “ be understood without a better declara-
 “ tion, for it may be understood three ways.
 “ In many towns, where closes and pastures
 “ lie in severalty, there is commonly a com-
 “ mon close taken in, out of the commons
 “ or fields, by the tenants of the town, for
 “ their oxen or kine, or other cattle, in
 “ which close every man is stinted, and set
 “ to a certainty how many beasts he shall
 “ have in the same, and of what manner of
 “ beasts they shall be.—Another manner
 “ of common is most commonly in plain
 “ champion countries where the cattle go
 “ daily before the herdman, and lyeth near
 “ adjoining to the common fields; and it
 “ may

“ may lie in two or three places or more.—

“ The third manner of common is the lord’s

“ outwoods that lie common to his tenants,

“ as common moors or heaths, the which

“ were never arable land.”

The same, or a similar distribution of lands remain in every uninclosed township to this day. Each township is ONE COMMON FARM; laid out into three arable divisions for *corn*; a flat of meadow land for *hay*;— and one or more *pastures* for stock.

It appears evident from observation in different Districts of the kingdom, that in laying out a township which contains a diversity of soil, the driest and best lands have been laid out as arable fields; the wettest, if sufficiently found, as mowing ground; and the remainder as pasture land, and as a source of fuel. In some townships, part of the pasture ground has been set apart as a stinted pasture for some particular species of cattle; and, in others, part of the common-field land has been laid to grass for the purpose of teddering horses upon in the corn years, and feeding sheep upon in the fallow year.

In townships of a more uniform soil, good land, fit for arable, has been set out as common pasture: for in the days when townships were laid out, it would have been less possible to have cultivated and manured the common fields of a township without a common pasture, than it would now be, when the uses of clover and vetches are known, to manage a farm entirely under the plow, without any possibility of purchasing manure.

It is therefore evident, that common pastures and common fields are in their original intention, and ever have been in their use, as inseparable as animal life and food:—it was necessary to keep working stock to till the fields, and almost as necessary to have other live stock to consume the straw, and to raise manure. And it may be safely drawn as an inference, that the *herbage* of the common pastures of a given township belong, *in their original intention*, to the arable and meadow lands of that township: for, without them, the former must have lain in perpetual fallow, and the hay of the latter have been useless. Consequently, *by the original intention*, every house which occupied a portion of the
arable

arable and meadow land of the township, had a right to a *like portion* of the *herbage* of the common pastures; and this without any regard to the time of its being erected; namely, whether before or after the laying out of the township.

But with respect to the *fuel*, and the *panage*, (when these were not reserved to the lord) the original intention was undoubtedly different; for a certain plot of woodland (for instance) was set out in proportion to the number of *houses* in the township at the time of setting out. This was a grant of the lord to the *houses* in being at the time of the grant; which particular houses thereby obtained an exclusive right to the fuel and panage thus granted; otherwise an unlimited and excessive increase of houses might have abridged the original habitations in their right, and have done away the original intention.

Since the improvements in navigation and the art of mining have taken place, many common woodlands have probably been cleared away; for it is evident, from observation

ervation confirmed by tradition, that many of the grassland commons, which now remain, and which a few years since were thickly scattered over the kingdom, were formerly covered wholly or partially with wood; the original sources of fuel and pannage: which *fuel and pannage* belonged exclusively to the original *houses*: consequently, when the land which produced them was cleared, the *houses* had a plea for an exclusive right to the *herbage* which succeeded.

Thus the *ancient houses* having, by original right, a claim upon the *wood*, and, by implication, upon the *herbage* which succeeded it, they became objects of importance compared with modern houses; and it appears to have grown gradually into a custom, which in time became law, that no modern house, nor even the lands of the township which lay to them, should enjoy either the fuel *or* the herbage of the commons.

Thus the ancient houses by implication gained in part, and by usurpation entirely, a privilege of *presenting* the lands of the township with the *freedom* of the commons: which
privilege

privilege has rendered them more valuable than modern houses of equal size; and this difference in value is the real interest they have in the commons.

It is the most they ever had, or can of right have, while the commons remain open. For a mere house without land has neither plow to work, manure to raise, nor fodder to consume, and cannot in the ordinary course of husbandry make any use whatever of the *herbage* of a common.

And with respect to the privilege of presentation, it is equally vague in the owner of an ancient house to lay claim to an equalized share of the lands of a common, because by a power (no matter *now* whether usurped or not) of enfranchising the lands of strangers to a share of the herbage, as it would be in a lay-presenter of a living to lay claim to the benefice, because he has the advowson. Whatever the *advowson* is worth, so much interest the presenter of the herbage of a common, or the profits of a living, has in that common, or that living.

From these premises we may infer, that *now*, neither an ancient house without lands,
of

of a given township, belonging to it, nor a parcel of land without an ancient house being held with it, is entitled to any share of the common herbage of that township. But, whenever this house regains land, or the land is again laid to an ancient house, the right of commonage returns. The right, therefore, only lies *dormant* ; and is not, in either case, *extinguished*.

The same of a site. While covered with ruins, it can have no right either to fuel or herbage ; but whenever the house is rebuilt and inhabited, a right of fuel returns ; and having had lands laid to it, a right of herbage. And whatever a site is worth over and above the value of the land it contains, so much interest it has in the common lands of the township it lies in.

The interest of *dormant lands* may be ascertained in a similar way : whatever their value is depreciated by the alienation from the commons, so much *less* interest they have in a division of them. To shut them out of an Inclosure Bill is to take them by surprize, and thrust them out of the township ; thereby strangling that right which before had only

slept; and which might the next year, or the next day, have awakened in its fullest lustre.

Beside these particular interests, there is one general interest to be considered; namely, the *situation* of lands, houses, and sites, with respect to the common to be inclosed;—for *houses*, at least, which are situated contiguous to a common, had in the first instance, have had ever since, and must have while the commons remain open, a greater benefit from its herbage, and have on that account been sold and purchased at a greater price than houses situated at a distance; and of course have a right to a greater share of the lands to be inclosed.

The interests of *sites* vary in a similar manner.

But, with respect to *lands*, this species of interest is less evident. While common fields and common meadows lie open, they have little advantage or disadvantage from situation with respect to the common pasture. But where the arable and meadow lands have been inclosed, and the pastures remain open, situation becomes of considerable importance. And where the appropriated lands have been

long

long held in severalty, and have been sold and purchased under those circumstances, the lands which lie near to the common pastures seem to have gained by the circumstance of inclosure, ratified by long usage, an extraordinary and *permanent* interest in the herbage : an interest which they can never lose so long as the appropriated lands remain inclosed, and the common pastures remain open. Hence it is unwise in those whose lands lie at a distance from the common pasture, to suffer a partial inclosure to take place ; for by that means they are establishing, to their own disadvantage, a species of interest in common pastures, which before had no existence.

Before we proceed farther, it may be proper to consider the *limits of common-right on unsinted* common pastures.

It is generally understood, and may, I believe, be considered as the common law of the realm, that each common-right house has a power to summer as much stock on the commons as the lands which lie to it will winter : or, to speak more practically, a right to stock in proportion to the value of the lands respectively held with the common-right houses:

for it so happens, that by improvements in husbandry since the time of laying out townships,—more especially where the appropriated lands have been inclosed,—commons in general are unable to support in summer so much stock as the arable and meadow land can winter; consequently it is become impracticable to adhere closely to the ancient regulation: which ancient regulation, however, though time has rendered it in most cases impracticable, is as strong an evidence as need be produced in favour of the herbage of unfenced commons belonging solely to the land.

That the idea is ancient, and not of modern invention, may be seen in Fitzherbert; who, in his 6th chapter, “Of Foreign Woods, where other men have common, but where the lord may improve himself,” says, “It is clearly ordained by the statute of Merton, and after confirmed by the statute of Westminster, that the lord shall improve himself of his wastes—leaving his tenants *sufficient* common. It is necessary to be known what is *sufficient* common; and that to me seemeth by reason should be thus: To see how much cattle the hay and the
“ draw

“ straw a husband getteth upon his own te-
 “ nement will find sufficiently in winter if
 “ they lie in the house and be kept therewith
 “ all the winter season ; for so much cattle
 “ should he have common in summer ; and
 “ that is *sufficient common*.” It consequently
 follows, that the occupier of a house without
 land could not of right keep cattle upon the
 common in summer ; because his tenement
 afforded him neither hay nor straw wherewith
 to keep them in the house during the winter
 season.

Lastly, the interest of the *lord of the soil*
 requires consideration. Here Fitzherbert’s
 treatise may be taken as a safe guide. The
 ground-work of the first seventeen chapters
 is a statute of Edward I. named *Extenta Ma-
 nerii* ; of which Fitzherbert himself gives the
 following account : “ In mine opinion, this
 “ statute was made soon after the Barons’
 “ wars, the which ended at the battle of
 “ Evesham, or soon after, in the time of
 “ king Henry III. whereat many noblemen
 “ were slain, and many fled, who after were
 “ attainted for the treason they did to the
 “ king. And by reason thereof their castles

“ and manors were seized into the king’s
 “ hands. And so for want of reparation the
 “ castles and manors fell to ruin and in decay.
 “ And when the king and his council saw that,
 “ they thought it was better to extend them,
 “ and make the most profit that they could of
 “ them, than let them fall to the ground and
 “ come to no man’s help and profit; therefore,
 “ king Edward I. ordained this statute to be
 “ made the fourth year of his reign, wherein
 “ is contained many and divers chapters and
 “ articles, the which at that time were but
 “ instructions how and what they should do
 “ that were Commissioners or Surveyors in
 “ the same.”

Instructions framed by Parliament and explained by an able Judge afford evidence of the highest authority.

A clause of the statute respecting common pastures runs thus: “ It is to be enquired of
 “ foreign pastures that be common how many
 “ and what sort of cattle the lord may have
 “ in the same, and what the pasture of a beast
 “ is worth by the year.”

It is this clause which Fitzherbert says is
 “ a dark letter to be understood without a bet-
 ter

ter declaration ;” because there are three sorts of commons : namely, a stinted common close ;—a tenced common, open to the common field ;—and the lord’s outwoods, or unstinted common pasture. In the two former, he says, “ the lord should be put to a certainty—and every man be stinted either by yards, lands, oxgangs, rents, or such other custom as the tenants use,—and the lord in like manner.”—But in the outwoods, “ me seemeth the lord should not be stinted nor set to a certainty, but put his cattle upon such manner of common pasture at his pleasure ; because the whole common is his own, and his tenants have no certain parcel thereof laid to their holdings ; but all only *bite of mouth* with their cattle :” by which is evidently meant (from various passages) *sufficient bite* for the tenants’ cattle. Hence it clearly follows, that if the herbage of the common be *more than sufficient* for the cattle of the township, the overplus, be it more or less, belongs to the lord. On the contrary, if the herbage of the common is *not more than sufficient* to summer the cattle, which the township can maintain in winter (in an uninclosed

state), the lord has not (*merely as such*) any interest whatever in the *herbage* of the commons within his manor.

In another clause respecting outwoods, specially,—the statute orders, that it “ be en-
 “ quired of foreign woods, where other men
 “ have come in, what part of those woods the
 “ lord may improve himself of, and of how
 “ many acres, and for how much the *vesture*,
 “ that is to say, the *wood* of every acre may
 “ be sold, and how much the ground is worth
 “ after the wood be fallen, and how many
 “ acres it contains, and what every acre is
 “ worth by the year.”

By this clause it is implied by Parliament, that the *wood* of a common belongs solely to the lord: and Fitzherbert’s exposition of it implies the same idea: “ The declaration of
 “ this statute is doubtful; because of the
 “ non-certainty of what is *sufficient common* ;”
 —which having explained as above, he continues, “ You shall understand that there be
 “ four manner of commons, that is to wit ;—
 “ common appendant,—common appurte-
 “ nant,—common in gross,—and common
 “ because of neighbourship. Common ap-
 pendant

“ pendant is where the lord of old time hath
“ granted to a man a mesep lace and certain
“ lands, meadows, and pastures, with their
“ appurtenances, to hold of him. To this
“ mesep lace, lands, and meadows, belongeth
“ common, and that is common appendant.
“ —Common appurtenant is where a man
“ hath had common to a certain number of
“ beasts, or without number, belonging to
“ his mesep lace in the lord’s waste ; this is
“ common appurtenant by prescription, be-
“ cause of the use out of time of mind.—
“ Common in gros is where a lord hath
“ granted, by his deed, common of pasture
“ to a stranger that holdeth no land of him,
“ nor ought to have any common but by
“ reason of that grant by deed.—Common
“ of vicinity or neighbourship is where the
“ waste grounds of two townships lie toge-
“ ther, and neither hedge nor pale between
“ to keep their cattle asunder :—this is com-
“ mon because of neighbourship ; and it is
“ not used nor lawful to pin the cattle so
“ going ; but in good manner to drive and
“ chace beside such common.”

Of common in grofs, he fays, “ the lord
 “ may not improve himfelf of any parcel ; for
 “ it is contrary to grant, though there be fuf-
 “ ficient of common.” But “ ye fhall un-
 “ derftand that how be it a lord may not im-
 “ prove himfelf of his wafte grounds, yet may
 “ he lawfully fall and fell all the wood,
 “ broom, gorse, furze, braken, fern, bufhes,
 “ thorns, and fuch other, as free-ftone, lime-
 “ ftone, chalk, turves, clay, fand, lead-ore, or
 “ tin, to his own ufe ; for the tenant may
 “ have nothing by reason of common, but
 “ only bite of mouth with his cattle.”

Hence we may conclude, that the cutting
 of *fuel* (if practifed) was *then* merely on fuf-
 ferance.

In his explanation of a clause refpe&cting
penage, &c. he fays, “ Where this ftatute
 “ fpeaketh *de panagio*, that is to be underftood
 “ where there is any maff growing in the
 “ lord’s wood, whereby men’s fwine may be
 “ fed and relieved ; what profit that may be
 “ to the lord ; for there is no man that can
 “ claim of right to have the maff, the which
 “ is a fruit, but the lord ; and the lord fhall
 “ have it in foreign or outwoods, as well as
 “ in

“ in his parks or several woods ; and as the
 “ quantity of mast is, so the lord’s bailey
 “ ought of right to lay men’s swine there-
 “ unto from Michaelmas to Martinmas, and
 “ to make a true account thereof at the lord’s
 “ audit, what he taketh for every swine.”

Thus it appears that not only *fuel* but *panage*, likewise, was originally a matter of sufferance when enjoyed by the tenants.

From these premises, and from the present *insufficiency* of commons, we may safely infer that the lord (merely as such) has no interest whatever in the *herbage* of commons within his manor. But we may infer, with equal safety, that of the *wood* of a common the lord is sole proprietor ; *except* where a right of fuel and panage has been established by long custom ; for, in this case, prescription has frustrated the original intention ; and, here, the *houses* have a joint interest with the lord.

Lastly, with respect to *heaths* and *peat-moors*, from which the inhabitants of a township have, by prescription, a right of cutting fuel.

The statute orders, that it be enquired of moors, heaths, and wastes, what they be worth by the year:—and Fitzherbert says, “ Moors, heaths, and wastes go in like manner as the herbage of the town; for the lord’s tenants have common in all such out-grounds with their cattle; but they shall have no wood, thorns, turves, gorse, fern, and such other, *but by custom*, or else special words in the charter.”

We may therefore conclude, that the lord has no interest in the *herbage* of a heath; nor in the *fuel*; except there be *more than sufficient* for the use of the inhabitants of the ancient houses; in which case the lord seems to have an interest in the overplus; *provided* he can reap the benefit of it without injuring the *herbage*.

From the sum of this evidence it appears, that, at this day, lords of manors in general have no other interest in the commons within their respective manors than in the *mines*, the *quarries*, and the *wood*. The *herbage* belongs to the land; and the *fuel* (where custom allows it to be taken) to the houses.

As

As to the *right of soil*, it appears to be merely *honorary*: for the soil cannot be removed, nor turned to advantage, without destroying or injuring the *herbage*. A lord of a manor has, however, a *claim* upon the *soil*, though indirect: for no man, nor set of men, can break it without his consent. But this seems to be a claim of *honor* rather than of *interest*; for, while the commons remain open, he cannot in strict legality reap any *emolument* from it.

Thus we have enumerated five distinct interests.

I. COMMON-RIGHT LANDS * HELD WITH COMMON-RIGHT HOUSES. To these lands
the

* By COMMON-RIGHT land is meant the original common field and common meadow land, and such other land, lying within the township, as has by grant or prescription a right of commonage when held with a common-right house; in contradistinction to such lands of the township as have not, and to the lands of the rest of the kingdom which never can have, by any legal act, such a right, though held with a common-right house. Suppose nine-tenths of the township in a state of temporary alienation, by some legal circumstance which could not be avoided, or by any circumstance whatever, could the other tenth part catch the opportunity in the interval of suspension, and appropriate

etc

the benefit of the herbage belongs, in proportion to their value; and the right of the respective parcels to share in a division of the lands ought to be ascertained by their intrinsic quality, and their affinity to the common (where this operates on their value in the open state) taken jointly †.

2. COMMON-RIGHT LANDS HELD WITHOUT COMMON-RIGHT HOUSES. The original right of these lands was indisputably the same

as the lands of the commons to this one-tenth of the township? It would be absurd to suppose it. If one-tenth cannot by any advantage choose the other nine, why should nine parts of a township be suffered to share the right of the tenth? See p. 56, l. 4.

† To set aside the lands of the township entirely (as in the case of Pickering) is too absurd to be treated of seriously. Suppose nine acres of ten, or ninety-nine of one hundred, of a given township, to belong to one house, and the other one hundredth part to be divided among two hundred and fifty-nine houses: or suppose the commons of a given township to contain many thousand acres, and the appropriated common-right lands to consist of 2376 acres; that the common-right houses of the township were only two, and that 2370 acres of the appropriated lands belonged to one house, the other six acres to the other house; would it be equitable in either case to divide by the houses? If not in these cases, why in any case where the principle of right is precisely the same?

same as that of the other lands of the township; and their *temporary alienation* is merely a circumstance which does not extinguish, but only suspends their right to a *benefit of the herbage*. Whatever this temporary alienation depreciates them below the other lands of the township of the same intrinsic quality, in similar situations, so much proportionably less is their right to a share of the *lands* of the common †.

3. COMMON-RIGHT HOUSES. The proportional rights of houses depends on the nature of the commons to be inclosed.

If they produce *herbage alone*,—a common right house ought to share with the lands in proportion to its *extra value* as such; that is to say, whatever it is worth more than a non-common-right house of the same *intrinsic* value, in a similar situation, so much it ought to be estimated at in the general va-

† The depreciation here intimated will seldom take place; for the appropriated lands of a township are worth *more* to the occupier of a common-right house; because they intitle him to a greater share of the common pasturage, than to the occupier of a non-common-right house, to whom they can seldom give any adequate privilege.

uation of the commonable property of the township*.

If the common to be inclosed produce *fuel alone*, the houses (or the houses and the lord of the soil, if an overplus can be proved) are alone intitled to it.

If *herbage and fuel jointly*, the lands and houses have rights in it proportioned to the herbage and the fuel it produces †.

COMMON-RIGHT SITES. The right of sites is similar with that of houses: whatever the dormant right of presentation and the dormant right of fuel are worth, so much in proportion

* The *extra value* of common-right houses varies with the value of the commons and the number of houses. Thus, suppose the commons of two distinct townships to be of equal value, and that one township contained ten, the other one hundred common-right houses; the right of presentation would be worth more in *that* than in *this* township; and where herbage alone is the produce of the common, the right of presentation and the extra value are the same.

† If part of the commons to be inclosed produce herbage alone, and other parts principally fuel, and a separate division be made (as in the case of Pickering), the *extra value* is compounded of the right of presentation to the herbage, and the right of cutting fuel; either of which being estimated, the other is of course sufficiently ascertained.

proportion they ought to share with the lands and houses.

5. THE LORD OF THE SOIL. To the lands of a common on which *open woodlands* still prevail, the lord of the soil has a principal right. But whatever the *bite of mouth* is worth, so much in proportion the *land* is entitled to; and if a right of *fuel* be established by custom, the *houses* have their claim. Whatever proportional advantage the several interests would receive in an open state, such proportions of the land they are severally intitled to under an inclosure.

If *valuable mines* and *quarries* be given up, the lord ought to receive an equivalent in *land*, and is entitled to some share for the mere *chance* of mines and quarries being hereafter discovered. But of *naked commons*, affording neither wood nor fuel, and of which the mines and quarries are reserved, the lord of the manor (merely as such) has not, on the principles offered, any right to share in a division of the soil, saving the honorary right which has been already mentioned *.

* In the case of Pickering, the Crown, as owner of the honor, forests, and manor of Pickering, (in right of

While the PICKERING BILL is before me, I will make a few further remarks.

1. *Five commissioners appointed*: three of them, only, being directed to value the common lands, and to set out the king's allotments. Of these three, one was nominated by the chancellor of the dutchy of Lancaster; one by the lessee of the tithes (who could have no special right of nomination, as no part of the commons was ordered by the act to be set out as tithes); and the third by the proprietors

the dutchy of Lancaster) had *one-tenth* of the principal part of the township, and *one-fifteenth* of the remaining part, granted by the act of Inclosure.

The woodlands, in this case, had formerly been inclosed and held by the Crown in fealty; and the remainder of the commons given up entirely to the appropriated lands of the township; shutting out even the park and some demesne land of the dutchy from a right of commonage; so that neither *wood* nor *woodland* is by the act given up: yet *all the manerial rights* are reserved; except the *honorary right of soil*, and except *q. a. riv. of stone and slate*: which last are sufficiently abundant in the old appropriated lands to supply the township with building materials and lime manure for at least a thousand years. Therefore, the consideration given up was of inconsiderable value—compared with that which was given as *equivalent*; but which appears to be, *in this particular case*, unreasonable and excessive.

proprietors of the township. Before the lands were valued and the allotments set out, the commissioner of the tithe-lease obtained an appointment under the Crown; in consequence of which the township was in effect valued, and the Crown allotments set out by the agents of the Crown, without the proprietors of the township having in any case a casting vote; their commissioner becoming, under these circumstances, a mere by-stander.

It would be well if, in cases of importance, *honorary commissioners*, chosen out of the independent gentlemen of the neighbourhood, could be appointed as a check upon acting commissioners in predicaments of this nature.

2. New roads to be made, and old ones to be repaired;—common-shores to be opened, and *public reservoirs* formed, by the commissioners, at the joint expence of the lands to be inclosed. The forming of reservoirs of the waters collected by the roads, for the purpose of public drinking-pools, ought to be a standing clause in every Inclosure-bill; and commissioners, most especially in up-

land situations away from running waters, ought to pay due attention to it.

3. Lands exceeding the yearly value of three shillings an acre to be divided and *inclosed*,—the residue to be *allotted, only*; leaving it in the option of the persons to whom they be allotted, to inclose them, or let them remain in a state of open common; subject to such regulations as the commissioners shall appoint. Too much cannot be said in praise of this distinction. Good land will always pay for inclosing, and be the most valuable in that state; but bad land is frequently too dear at that price: many men of comfortable fortunes have, in this District, been beggared, and the fortunes of others injured, by the inclosure of lands which have not yet paid, nor probably ever will pay, for inclosing; and the same may be observed in other Districts of the kingdom.

4. A good regulation respecting *fences* is likewise noticeable. The act allows a privilege of placing a fence on the outside of the ditch, upon the adjoining allotment, to defend the face of the young hedge; and to
remake

remake and remove such fence during and within the space of ten years. Also to continue the fence at the ends (by rails reaching over the cross ditches) to the posts or rails of the adjoining cross fences.

5. Lastly, the reference of matters in dispute to a *trial at law* requires the most mature consideration.

The appropriation of common lands is a serious act : they are useful to individuals in an open state ; but would in general be much more useful in a state of Inclosure. Whoever has reaped a rightful benefit of them, time immemorial, ought to have that benefit continued to them : and all that Parliament has to do is to ascertain the quantity of right of each party or interest concerned in the particular bill before them ;—*or* to refer special matters in dispute to some other inquest more adapted to the necessary enquiries ;—*or* to refuse the application.

A court of assize is, perhaps, the most improper inquest which could be referred to for settling disputes respecting Inclosures : and are beyond dispute much worse adapted to make the necessary enquiries than a com-

mittee of the House of Commons; where every Member is a *judge*, and has sufficient time for deliberation; whereas in a court of assize all is hurry and confusion; with only *one* man to think, and the mind of this one man necessarily crowded with a chaos of ideas.

It will however be said, that a special jury of the county in which the site of Inclosure lies, are the fittest to determine the rights of the claimants. This in theory is plausible; but is seldom verified in practice.

In the case of Pickering, only four of the special jury attended; and one of these was a tradesman of the city of York. It is highly probable, that not one of the jury resided within twenty miles of the site of Inclosure; or had the smallest share of personal knowledge either of the site or the subject of Inclosure. A jury impanelled in any other county of the kingdom would have been equally qualified for the purpose.

It was therefore a *mere trial at law*, which, to a proverb, is a game at hazard; and the wisdom of Parliament, which has shone forth on many great occasions, loses much of its lustre when it refers matters of importance from
from

from a committee (chosen, it is to be supposed, with judgment and impartiality, from among themselves) to a *jury*; or, in other words—to *manœuvre* and *chance*.

It is far from my intention to say any thing in stronger language than the subject requires; but it strikes me clearly, and I flatter myself that I am not influenced by any principle of disrespect either to the laws of my country, or to the makers of them, that it would be more judicious in Parliament to refer to the dice-box, than to a jury in a court of assize: for in one case *chance* alone is concerned; in the other, *chance* and *manœuvre* may operate jointly.

In the case of Pickering the houses were within a point of losing the game: Sir Thomas Davenport died, and Mr. B. (their two leading counsel) was put under arrest the day before the trial was to have come on; and their agents, sanguine as they had heretofore been, now on those *accidents* happening, gave themselves up to despair. But, by chance, or by manœuvre, the trial was postponed. The houses now came into court fully prepared, while the land, by a train of ill luck or bad

management, was, in effect, left without an advocate; and solely by “the uncertainty of the law” lost its right. Even the house-owners themselves considered the verdict as a game artfully won—and their *large* allotments as plunder bravely got. Right was out of the question: the idea of it had been absorbed long before the decision, in rancour and ill blood; a circumstance more to be lamented than the inequitable division of the commons.

In the case of KNARESBOROUGH, too, a dispute between the land-owners and house-owners was ordered to be decided by *legal contest*. There, as at Pickering, the houses *

* In this case the houses were divided into *messuages* and *cottages*—one messuage was considered as equal to two cottages. This distinction, which is not uncommon, has most probably arisen from the circumstance of the woodlands being grubbed for the sake of herbage. A messuage, namely, a house with which land was anciently occupied, had not only a privilege of cutting *fuel* in the outwoods, but, of necessity in early days, a privilege of taking *plowbolt*, *cartbolt*, &c. Hence its claim upon the *herbage* which succeeded the *wood* became greater than that of a mere cottage, with which no lands being occupied, had no use for implements of husbandry.

claimed

claimed the whole; but the lands *happening*, in that case, to employ the better forces, they *won* the day. Almost the whole forest was divided among the land-owners: even a messuage did not share, on the best land, more than two acres. The land-owners had offered the house-owners a greater proportion; but they chose to take their chance in a court, as other desperadoes do their chance in a lottery—a landed estate, or nothing; and, it is said, what some of them got did not pay their extra expences. Here the *poor* man lost his right; a circumstance which renders the case of Knaresborough *harder* than that of Pickering.

These are facts which appear to be sufficiently striking to induce Parliament to establish some general principles of Inclosure, and to enquire themselves into the rights of claimants: or, if a committee of Parliament cannot conveniently determine, to order reference to a commission of independent disinterested men in the immediate neighbourhood of the site of Inclosure; who having personal knowledge of the premises and the claiming parties, are best enabled to judge of
their

their respective rights: or, if the opposition in Parliament be strong, and the matters in dispute too weighty to be left to reference, to send back the petitioners, and let the commons remain open. It does not follow, that because a few individuals, instigated, perhaps, by one more interested than the rest, take it into their heads to try their fortune in Parliament, that a suite of valuable commons should of necessity be inclosed. A few years might reconcile differences in opinion; and, then, there might be no difficulty in assigning every man his rightful share.

The fate of SINNINGTON was determined by that of Pickering; the different interests having agreed, previous to the trial, to abide by the decision of the court.

The Sinnington bill is entitled to a few remarks:

1. *Title.* It is difficult to write with temper on the subject of tithes. At the time they were instituted, specie was little in use as a medium between the producer and the consumer of the productions of the soil; and then it was necessary, if an indigent clergy were necessary, that they should be supported

our

out of the immediate produce. But to continue this ancient regulation, in a time when money is become the universal medium of property, when the clergy are no longer the admiration or the terror of the occupiers of land, and when improvements in cultivation engage the attention of all ranks of mankind, is an impropriety which none but the advocates of oppression will defend.

A general dissolution of tithes, though fervently to be desired, is not probably yet near at hand : the bugbear *innovation* is at present too terrible in the eyes of the Many : but, under the circumstances of the present times, to *increase* the quantity of titheable lands, as in the case of appropriating commons without assigning some certain part of them, or some other equivalent, in lieu of tithes, is a *crime* which posterity can never forgive.

In the case of Sinnington, every thing is done which, under the false principles of the bill, could be done : indeed more ; for even the general principle of the bill was broken into with respect to the tithes. The act assigns *one-tenth* of the commons *for the tithe of the commons* ; and afterwards empowers the commissioners to set out a further

ther parcel of them for *half* the tithes of the old-inclosed lands of the township belonging to the common-right houses: which is in effect giving so much of the commons to the common-right *lands* independent of the *houses*. And further authorises the commissioners to award a perpetual modus or money-payment in lieu of *the other half* of the *common-right lands*; and for the *whole* of the *dormant lands*; namely, such lands as had not, some time previous to the passing of the bill, a common-right house *belonging* to them*. Thus the entire township is freed for ever from a species of oppression which the whole kingdom is entitled to be relieved from.

2. *Lord of the soil.* The Sinnington Bill assigns one *five-and-twentieth* for the *right of soil*

* The life ground of this distinction has been already shown. Suppose a transfer of a principal part of these lands to have taken place (through ordinary circumstances without any sinister views to an Inclosure) about the time the exclusion of right takes place,—would the mere *circumstance* of fixing the particular day of exclusion twenty-four hours before or twenty-four hours after the day of transfer, alter, either one way or other, the *natural right* of such lands to share in the benefits of the Inclosure!

only;

only ; all other manerial rights whatever being reserved. No *quarries*, or known beds of *marl*, &c. on these commons.

3. *Denizen right*. The priory of Keldholm, which anciently stood at a short distance from these commons, without the boundaries of the township of Sinnington, had a right or freedom of commonage for sixty beasts and four hundred sheep. This right has of late years, and perhaps ever since the dissolution of the priory, been exercised in part, but never perhaps wholly. The Earl of Scarborough, who is at present in possession of this right, has received little more than a yearly acknowledgment : nevertheless, on a division of the commons, his claim became important ; for the ancient right, in its fullest extent, was equal perhaps to half the pasturage of the commons under inclosure.

In this case the dictates of common prudence would have led the promoters of the bill to have fixed the quantity of right before they went to Parliament. This, however, was neglected, and all the act empowers the Commissioners to do in this respect is to examine into the merits of the claim,

claim, and fet out fuch a part of the commons as appears to them to be a compenfation. The confequence is, an injun^{tion} has been granted to flop proceedings: through which aukward circumftance the inclofure is at a ftand, to the no fmall inconveniency of the townfhip. A certain and confiderable expence is incurred—commonable ftock fold off—and fencing materials prepared—without, at prefent, any certain advantage accruing; a predicament this, which ought to caution the promoters of bills of Inclofure to have a clear underftanding with the feveral interefts concerned before they burden the townfhip with the expences of a bill, and the confequent inconveniencies.

4. *Alien claim.* Another claim is made upon thefe commons—by the owner of a farm which lies by the fide of them, and whole ftock has, time immemorial, been fuffered to depafture upon them. It is fuppofed that this encroachment has been made thro' the means of a *windrake* * acrofs a corner of thefe commons to a river which runs at a diftance; or that it has been fuffered to take

* See FEATERS AND TENURES.

place through mere neglect : be this as it may, it ought to be a lesson to uninclosed townships to attend to the stock of their respective commons. I term it an incroachment, because there is not a more general position than that the commons of a given township belong in original right to the lands and houses of that township, and that no right of commonage can be justly claimed by the lands and houses of another township, unless a special grant, or something adequate to it, can be produced. Custom may, in this case, be considered *in law* as adequate to a grant ;—although in equity and common sense it might seem more reasonable to award damages for a trespass, rather than a portion of the commons as a compensation.

5. *Fencing.* The whole to be inclosed within six months from the time of staking out. Counter fences may be made upon the adjoining allotment, and over the terminating cross ditches. Sheep to be kept out of the new inclosures during the first seven years ; and all kinds of stock out of the lanes during ten years ;—after which time the surveyors of the *roads* of the township may let the grass of
the

the lanes and bye-ways, and apply the rents to the repair of the roads.—Admirable clause !

6. *Appeal.* By this bill, persons aggrieved may appeal to the Quarter-Sessions ; except in such cases where the determinations of the commissioners are directed to be final. This, *in some cases*, may be a check upon the acting commissioners ; but is far from being equivalent to a special commission of gentlemen resident in the neighbourhood, who would, in *all cases*, be on the spot, to be appealed to. To do strict justice to every individual, in a complicated business of this nature, is beyond the power of abilities and honesty to accomplish ; but the nearer this summit can be approached the better ; and every probable means should be employed in attempting it.

In the case of MIDDLETON, *half* the commons were assigned to the HOUSES, *half* to the LAND, in proportion to the *land-tax* : a mode of division which has, I believe, been pretty generally adopted in the Vale.

This method of apportioning the shares of the land owners is, in townships where the
land-tax

land-tax is levied by rack-rents, more equitable than it is in cases where it is paid by ancient valuation, as it was in Middleton when the Inclosure took place : but it cannot in either case be strictly equitable ; nor approach so near to strict equity, as a valuation according to circumstances at the time of inclosure.

On *this* alone an equitable division of commonable lands can be made : not with respect to land only ; but with regard to every other species of commonable property. Whatever benefit the several interests, and the individuals of the respective interests, rightfully enjoyed previous to the inclosure or were, *in reversion*, rightfully entitled to, (as dormant lands and houses), such proportional benefit they are severally entitled to, under the Inclosure.

Before I take leave of this subject, I will note the effects of the three different means of Inclosure which have been, in different townships, made use of in this District : namely,

1. Inclosure by Exchanges, &c.
2. Inclosure by private commission.
3. Inclosure by Act of Parliament.

1. *Incloſure by Exchanges.* In the north-weſt diviſion of the Vale, the common fields and common meadows have moſtly been incloſed progressively, piece after piece; either in the original ſlips, ſingly; or more than one of them have been joined by purchaſe, or by private exchanges between the ſeveral proprietors: by which means the whole of the appropriated lands of the townſhips in which this ſpecies of Incloſure has taken place, have been, in proceſs of time, incloſed and held in ſeveralty.

This method of Incloſure is attended with at leaſt one diſagreeable conſequence. The common-field lands having lain principally in ſingle ridges, ſome of them perhaps near a mile in length, the Incloſures are badly proportioned. They are either too long for their width, many of them reſembling lanes rather than fields; or, if cut into lengths, there are no drift-ways to the inner diviſions:—beſides, much unneceſſary fencing, with all its attendant evils, is by this mode of Incloſure incurred; and what is yet worſe, each man's property is ſtill, perhaps, ſcattered over the townſhip.

2. *Inclo-*

2. *Inclosure by private commission.* Some entire townships (except perhaps the unstinted commons), and many stinted pastures, have been laid out by commissioners, chosen unanimously by the several interests concerned, without soliciting the assistance of Parliament.

By this means the distinct properties are laid together, in well-sized and well-proportioned Inclosures, with proper roads and driftways; and this without the expence, the inconveniency, or the *bazard* attending an application to Parliament.

3. *Inclosure by Act of Parliament.* By this expedient the advantages above-mentioned are obtained in their fullest extent; but they are unavoidably burdened with a train of attendant evils, which render this mode of Inclosure much less eligible than that of inclosing by *general consent*.

This, however, is frequently impracticable: obstinacy has its adherents in every township; and where various interests are concerned, as in the case of dividing unstinted commons, it is scarcely possible that every interest, and every individual of each inte-

terest should be of one mind. Therefore, without *some* exertion of legal authority, unfinted commons in general must continue to lie open.

But it does not follow that, because some is necessary, much should be used. It may be received as a sound position, that in cases where an Inclosure would be highly beneficial to a township at large, a great majority of the individuals concerned would forward a measure evidently calculated to promote their own interest; provided they could obtain it by some *certain* and *known* means. It is the idea of giving up a *certainty* for an *uncertainty*, of entering the list of contending interests, and of being outwitted or overpowered by their neighbours, which deters men, whose fortunes are not desperate, and whose dispositions are peaceable, from engaging in *contests* about Inclosures.

At present, a notice of a petition to Parliament, for the appropriation of unfinted commons, implies the watchword *havock*:—he is the best fellow who gets the most plunder. And, until some GENERAL LAW OF INCLOSURE be established, this *uncivilized* mode

mode of procedure must necessarily continue.

The multiplication of statutes has ever been spoken of as an evil; and though public acts may in general be meant, private bills may properly be included. There needs no apology therefore for venturing to recommend *one* Act of Parliament which would preclude the passing of a thousand.

Bills of Inclosure must occupy much of the attendance of Parliament, and divert their attention from matters of public importance. Besides, private interest, although it may not be able to exert its influence in Parliament at large, may be difficult to shut out entirely from its committees: but what can lower the dignity of Parliament more than private interest being permitted, in any way, to warp its determinations?

That a GENERAL BILL OF INCLOSURE might be framed to answer the purpose of an equitable appropriation of commonable lands, in a much higher degree than has been, or perhaps ever can be obtained by separate bills, appears to my mind indisputable; and why such a measure has not long ago been

adopted, would be difficult for any man out of Parliament to conceive.

It would be improper in me to dictate to Parliament, and might be wrong to offer my sentiments too freely in this place; but having ventured to censure the present mode of Inclosure by Act of Parliament, it is incumbent on me to convey some idea of what I conceive would be an improvement.

In every township, four distinct interests claim a right of sharing in its commonable lands: namely, *lands, houses, tithes*, and the *lordship*. The two former have a benefit in commons in their open state; but the benefit of the other two arises solely out of the Inclosure*. Hence it follows, that it is the consent and approbation of the two former interests which ought to be obtained previous to a change from the open to the inclosed state; for the two latter may be supposed to be always ready to receive proposals for an Inclosure.

It

* The tithe of wool, lamb, and milk only excepted; articles of small value compared with the tithe produce of lands in a state of cultivation.

It has already been seen, that when the tithe and the lordship are able to draw over to them a third interest, they can gain the desired point. But the evil effects of Inclosures thus conducted have also been seen. Therefore, in fixing a general rule for the quantity of approbation requisite to an Inclosure, the other interests are more particularly to be attended to.

Were the lands and the houses equally situated with respect to the commons to be inclosed, *a majority* of each might be sufficient. But this not being the case in any township, a larger proportion seems necessary. *Three-fourths* might in many cases be too small; but as Inclosures are, in all human probability, beneficial to the public, it might be impolitic to fix it higher.

Thus it appears to me, that in framing a general law of Inclosure, three-fourths in value of the land, and three-fourths in number of the houses, with the consent of the lord of the soil, ought to be considered as the requisite QUANTITY OF APPROBATION.

The QUANTITY OF RIGHT of the several interests, and of the individuals of each interest,

has been already discussed : and although the present sketch may not afford sufficient matter for the completion of the general law proposed, I am clearly convinced that, without any extraordinary exertion of study or application, such a law might be formed.

Unfinted commons would constitute the principal object of the bill ; but stinted commons, common fields, common meadows, and every class of special matter respecting Inclosures, might be included and provided for.

Authorized and guided by a general law of this nature, the business of Inclosure would be safe and easy. Every man before he set out would know with certainty his proportional share ; and the Act would empower the several interests to make choice of commissioners to secure to them their respective rights.

Numberless Inclosures remain yet to be made ; and it were much to be regretted that the attention of Parliament should be so unprofitably employed ; and that the property of individuals should be subjected to
so

so much hazard, as it is to be feared they will be, while common lands are continued to be appropriated by SEPARATE BILLS, without any ESTABLISHED PRINCIPLES OF INCLOSURE.

6.

FARM BUILDINGS.

THE BUILDING MATERIALS which are now in common use on *this* side of the Vale are, chiefly,

Stones,
Pantiles,
Deal:

But there are other materials which require to be noticed; namely,

Bricks,
Cement,
Oak.

1. STONES. The stones in use are of two kinds: *freestone* and *limestone* *. The former

* In the quarries from which these materials are drawn, the limestone generally forms the upper stratum, rising to within a few inches of the surface. The
foil

mer being less perishable, are used for foundations, coins, cornices, and the coping of ridges and gables; the latter, being more easily raised, and requiring less labour in dressing them for use, are, in farm-houses at least, generally used in facing the walls; and when properly hammered, and properly sorted so as to give the thickest to the lower courses, lessening the size of the stones from five or six to three or four inches thick, as the building rises, a neater material need not be desired; nor, if kept free from constant moisture, one which is more lasting, or which preserves the face of youthfulness so long.

2. PAN-

soil itself is generally a limestone gravel; under which is frequently found a stratum of thin slate like limestone, which increases in thickness as the depth increases; from one to four or six inches thick; lying in general loose and horizontal. These are the "walling-stones" used in the face of buildings; for which use one of their edges is *hammered* into a brick-like form: an operation somewhat tedious; but not equal to that of chiselling freestone. Under the walling-stones, an irregular limestone rock (of many feet in depth perhaps) is usually found; and under this a bed of freestone, of unassumed depth.

2. PANTILES. Formerly, *straw* and a heavy kind of *slate* were the common coverings ; but of late years *pantiles* have become universal, for ordinary buildings ; and *blue slate* for better houses.

In the southern counties pantile is considered as an ordinary material : but the estimation of it there arises from an improper method of using it ; not from any intrinsic demerit of the material itself when properly manufactured. From London to Grantham in Lincolnshire, scarcely a roof of pantile occurs : north of Grantham it is become the almost universal covering. It has two qualities sufficiently valuable to recommend it in any country : cheapness and lightness.

Much however depends on the *manufacturing*, as well as on the *laying* of pantiles. If the materials be not sufficiently exposed to the action of the air ; or, if of dissimilar natures, though sufficiently tempered, they be not united *sufficiently* into one homogeneous mass or uniform substance, the tiles which are made from them are liable to perish ; not only before burning as well as in the kiln, but after being exposed to the influence of the

the

the atmosphere upon the roof of a building. Or, if the materials be good and well-prepared, the moulds be truly made, and the moulding skilfully executed;—still, if they be suffered to warp in drying, or to twist in being set injudiciously in the kiln, they are wholly unfit to be laid on as a covering material; and every judicious workman refuses them. Were workmen in general, or those who have the superintendency of workmen, more scrupulous in this respect than they generally are, manufacturers would be more diligent in their endeavours to approach the standard of perfection; by which means this, in many cases, most eligible covering might grow into universal estimation.

3. DEAL. In a District furnished with three considerable sea-ports, and a river-navigation, it is no wonder that deal should have been long in use as a building material. Floors have been laid with it for near a century; and of late years it has been used for almost every purpose of building. Beams, joists, and entire roofs, are now almost universally made of fir-timber.

4. BRICKS.

4. BRICKS. Where stones are far to be fetched, as towards the center of the Vale, bricks are become a common material. If brick earth be found near the site of building, as it generally may in situations where stones are scarce, clamp bricks are considered in this country, where coals may be had at a moderate price, as the readiest and (all things considered) the cheapest walling material.

5. CEMENT. Formerly, ordinary stone-buildings were carried up entirely with "mortar;" that is, common earth beaten up with water, without the smallest admixture of lime. The stones themselves and the fillings (of stone) were depended upon as the bonds of union; the use of the "mortar" being merely that of giving warmth to the building, and a degree of stiffness to the wall.

The event, however, proves that walls built without lime have in many instances stood for ages. Even part of the walls of PICKERING CASTLE, formerly esteemed a fortress of considerable strength, have been carried up with a cement which, to appearance, seems little superior to common mortar :
never-

nevertheless, such is the effect of time upon walls which are exposed on every side to the atmosphere, that they now hold together with considerable tenacity.

To this effect of time ; or, more accurately speaking, to certain laws of nature which in process of time produce this effect ; we ought perhaps to ascribe the stone-like contexture of the cements of ancient walls, rather than to any superior skill in preparing them.

The citadel or central stronghold of the fortress under notice has been built with better cements, which, however, vary much in outward appearance. One specimen which I have collected, is a smooth chalk-like substance ; another, a coarse rough mass composed of sand and small gravel, with a smaller proportion of chalk-like matter.

In the fosse which surrounds the outer wall lies a fragment (perhaps part of the parapet or the embrasures of the outside wall), whose cement has acquired a stone-like hardness, especially the part which is exposed to the outer surface*.

I have

* The age of this fortress would perhaps be difficult to ascertain. Part of the outer wall was repaired and some

I have bestowed some attention on the decomposition of these four specimens. The results are as follow :

EXP. I. CEMENT OF PICKERING CASTLE :
— the *coarser* specimen, taken from the ruins of the *central tower*.

In *general appearance* it resembles dirty chalk, thickly interspersed with small gravel ; some of the granules as large as peas. Its *tenacity* that of common writing-chalk ; the asperities easily broken off with the fingers.

One hundred grains, pounded, dried, immersed in water, and balanced together with the menstruum, lost in solution $25\frac{1}{2}$ grains of air ; and yielded by filtration 40 grains of residuum ; affording by elutriation 35 grains of gravel and rough sand, and 5 grains of suspendible mud-like matter : the solution yielding by precipitation 64 grains of calcareous earth.

35 grains

some towers raised by (I think) Edward VI. But when the parts which are here the subject of notice were erected, is probably uncertain. They are said to be of very great antiquity.

35 grains of sand and gravel,

5 grains of silt,

64 grains of pure chalk,

104 grains.

From this analysis it appears,

1. That the *proportion* in this case (supposing crude limestone in lumps fit for burning to be of equal weight with sand and gravel) was three measures of unflaked lime in lumps to two of sand and gravel.

2. That the sand and gravel in this case had been *washed*; either by the brook which runs at the foot of the Castle mound, or more probably, by hand; the proportion of dirt being smaller than that which is generally found among *drift sand*.

3. That the lime had not regained the whole of its *fixt air*. The increase of weight, which appears in the synthesis of this experiment, is a sufficient evidence, were it not corroborated even unto proof by the deficiency of air thrown off in the solution. To try whether the increase on one hand, and the deficiency on the other, agreed as to quantity, I resuspended 50 grains of the chalk
obtained

obtained in this experiment : it lost exactly 23 grains in solution ; as $50 : 23 :: 64 : 29\frac{1}{2}$. Therefore the increase of weight in this case appears to be wholly owing to the deficiency of air.

EXP. 2. CEMENT OF PICKERING CASTLE :
finer specimen of the central tower.

General appearance that of stale lime, run together with water, and baked to a crust : almost a pure white : surface rough ; shewing the cells and the unbroken granules of the original lime.—*Contexture*, more brittle than common chalk ; full of pores ; does not appear to have been much *worked* at the time of preparation.

One hundred grains yield in decomposition, twenty-one grains of air.

42 grains of whitish grit,

5 grains of suspendible dust-like particles,

56 grains of pure chalk.

103 grains.

OBS. The residuum in this experiment is evidently *the powder of freestone*. The particles are small, and of irregular figures ; very different in appearance (when magni-

fied) from common sand. I was at a loss to ascertain their nature, until pounding some freestone, and washing it in the manner I had done the residuum, I found it to resemble exactly the forty-two grains of washed grit of the experiment. It appears to have been pounded or ground very small, and to have been put through a fine sieve; the whole being in a state of *grit*; no fragment so large as a pin's head.

It is observable, that the cement of this experiment is *weaker* than that of the last: but whether from the nature of the *base*, or from the *proportion* of lime being less, or from the two united, is not evident.

It is also observable, that in the decomposition of this specimen a urinous smell rose during the solution; and that the edges of the first filter attract moisture from the air. It is at present a practice among some plasterers to make use of urine in the preparation of plaster.

EXP. 3. CEMENT OF PICKERING CASTLE: taken from the ruins of the *old outer wall* facing the northwest. Collected in three or four different places; a few feet above the foundation;

foundation ; and mostly from the inner parts of the wall (where it has parted) ; not from the outer surface.

Its *appearance* that of sandy loam, interspersed with specks of chalk ; some of them larger than peas. Its *fragility* similar to that of dried brick earth.

One hundred grains of this specimen yield thirteen and a half grains of air.

30 grains of rough sand, and a few large fragments,

37 grains of silt and fine sand,

36 grains of calcareous earth.

103 grains.

Obs. There are two causes of the *weakness* of this cement : the small *proportion* of lime, and the impurity of the *base*: a heterogeneous mass of fragments of various kinds, some of them apparently gypseous ; of sands of different species, principally of a crystalline aspect ; but chiefly of mere mud, or of sand so fine as to be impalpable between the fingers. It is therefore evident, that the materials, in this instance, have *not* been *washed*.

EXP. 4. CEMENT OF PICKERING CASTLE : taken from a *fragment* in the north-west corner of the ditch.

In *general appearance* somewhat resembling the last noticed specimen ; but in *texture* very different. The crust of the outer surface, which has been exposed to the influence of the atmosphere, probably, during many centuries, has acquired almost the hardness of limestone : nor is any part of it to be broken with the fingers : nevertheless, this specimen, also, is full of lumps of unmixed lime ; some of them the size of small hazel nuts ; and at the time I took the specimen (the season wet), as soft as butter ; when dry they are of the consistency of very soft chalk.

One hundred grains of this specimen yield fifteen grains of air.

8	————	grains of fragments,
12	————	coarse sand,
36	————	fine sand,
3	————	of a fizelike matter,
45	————	chalk.
<hr/>		
104		grains.

Obs. The constituent parts of this residuum resemble those of the last specimen; excepting the absence of the mud, which has evidently been *washed* away; and excepting the presence of a mucilaginous matter, whose nature I am not at present able to guess; nor have I leisure at present to pursue the enquiry.

GEN. OBS. I. All these cements, whether weak or strong, have laid hold of the stones with a degree of firmness proportioned to their respective strengths. Every crevice of the wall is filled with cement: the whole form one united mass,

Hence it is more than probable that these cements have been poured into the walls in a liquid state, in the state of *puddle*; and they appear to have operated, with respect to compactness, as the *puddle* of the canal-makers.

2. The subjects of Exp. 3, and 4. are strong evidences, that in the preparation of these puddles the ancient builders were very deficient. Not more than half of the lime they contain appears to operate. The lumps, whether large or small, are *more* than wasted;

weakening rather than strengthening the cement.

3. From the whole of these experiments it is evident, that the several cements had acquired the principal part of their fixed air; chiefly, perhaps, after they were deposited in the buildings. The air in the stronger specimens bears a considerable proportion to the entire quantity of cement; and being insinuated in the close state above-mentioned, must have added greatly to its *compactness*.

Hence it is highly probable, that the stone-like tenacity of old cements is chiefly owing to a transmutation from lime and sand to calcareous earth and sand;—a substance resembling the original limestone.

On examining a wall which has been built with loam alone, without any admixture of lime, and which has probably stood about a century, I find that the loam has laid no hold whatever of the stones; and that time has made no alteration on its contexture. It is still the same friable substance it probably was the day it first became dry in the building; without having the smallest appearance of acquired tenacity, obtained during the
century

century of time it has been exposed to the influence of the atmosphere.

It is therefore probable that the atmosphere imparts nothing, *voluntarily*, of a cohesive nature to the mortar of walls which are exposed to it.

But it is more than probable that cement, containing a portion of lime, imbibes from the atmosphere something which gives it a degree of tenacity superior to that which it had on its first becoming dry in the wall; and it is a fact well established, that lime begins to imbibe, the moment it grows cool from the kiln, *that* which the fire has deprived it of; namely, fixed air; which fixed air being imbibed, after the cement is deposited in the walls, is, *probably*, a principal cause of tenacity.

This being admitted it may seem to follow, that the more quickly it is transferred from the kiln to the building, the greater portion of air will be imbibed after it is laid in the walls, and of course the greater effect will *time* have on the tenacity or cohesion of the cement: and hence we might be led to infer, that if the ancients had any superior skill

in this matter, it consisted in their hastening the lime from the kiln to the building.

But, in practice, it is observed that fresh-made mortar does not *set* so well; does not cohere into a soft-stone-like substance so readily as that which has been prepared some time before it be used.

This fact, perhaps, is accounted for in the lime having had, under this circumstance, time to lay hold of the particles of *sand* with which it is intermixed.

But, on the same principle, it seems to follow, that if the preparation be made too long before the mortar be laid into the wall, it will have regained too much of its fixed air, to lay hold, sufficiently, of the *stones*, or other materials, which it is intended to bind together.

Be this as it may, it is common, in practice, when mortar is not used presently after making, to cover it up closely from the outward air. It is the opinion of a person, who has paid this subject considerable attention, that if mortar be buried within the surface of the ground, it may be kept twelve months in perfection.

The

The same person, whose penetration and judgment in the few subjects he has more particularly employed his mind upon are superior to those of most men, has struck out a new idea relative to the *slaking* of lime for mortar.

Lime, whether it be intended for cement or for manure, ought to be reduced entirely to a dry *powder*. And for cement it ought to be mixed, in this state, evenly and intimately with the sand.

It is almost, if not utterly impossible to reduce lime *entirely* to powder, with *water* alone; some part or other will always be super-saturated, and thereby be reduced to a *paste*; while the outsidess which are exposed to the atmosphere will (unless the stone be extremely *fine*) fall in *granules*, not into powder.

Every piece of paste and every granule, though but the size of a pea or a mustard seed, is useless, if not detrimental to the cement; for with these the granules of sand cannot be intimately mixed; much less be coated with them; as they may, and undoubtedly ought to be, with *lime-in-powder*.

But

But if instead of water, *wet sand* be used in slaking the lime; (piling it with the lime-stone, layer for layer, and covering up the heap with it;) those evils are avoided: no part is super-saturated, nor are any granules formed by the action of the outward air.

Besides, another great advantage is obtained by slaking the lime, in this manner, with the sand with which it is intended to be incorporated. The two ingredients, by being, perhaps, repeatedly turned over; and by passing through the sieve together; necessarily become intimately blended; more intimately, perhaps, than they could be mixed by any other process equally simple. If the sand be *washed* (and all sand mixed with lime for cement ought to be washed) the labour of preparation is by this method of slaking the lime considerably lessened,

But in the preparation of cement, SLAKING THE LIME makes only one stage of the process; MIXING THE INGREDIENTS intimately, and uniting them closely together into one compact homogeneous mass, is an operation which requires the strictest attention.

We

We have seen the uselessness of unburst lumps of lime in cement; and the good effect of *puddling* cement has been at least conjectured.

Compactness seems to be essential to the *hardness* of cement. When mortar is laid in with the *trowel*, it remains in the state in which it is laid, and does not run together into a close form, like melted metal or

LIQUID CEMENT.

Much care, therefore, is requisite in the preparation of mortar for the *TROWEL*. Working it with the spade alone is insufficient. Beating it with the edge of a board, a kind of wooden axe, is more efficacious, but is very tedious. *MILLS* for the grinding of clay are common, and sufficiently effectual of the purpose intended: but a mill for the grinding of mortar I have not yet either seen or heard of!

6. *OAK*. This is now almost wholly laid aside as a material of the house-carpenter; except for door and window-lintels, wall-plates, and some few other purposes, which require strength and durability. The ports of Whitby and Scarborough take off the

larger

larger timber; and the refuse has of late been much in demand for the purpose of inclosure. Deal has of course gained ground as a building material. There are, however, some few men who still retain a sufficient partiality for the oak, to use it freely in every species of building, under a full persuasion that in the end it will prove the cheapest material.

Having thus enumerated the materials of building in most common use in the District, I will proceed to give some account of the BUILDINGS themselves; and of such OPERATIONS in rural architecture as merit particular notice.

The spirit of improvement which has so evidently diffused itself through this extensive county, is in no particular more conspicuous than in Farm Buildings; nor, perhaps, does any part of it afford so many striking *innovations* in this particular as that which is under survey.

The FANCY-FARM-HOUSES, which have been erected in different parts of it, I purposely pass over. Taste, whether true or false; mere ornament without use; is foreign

to the present subject: and I have in another work, professedly on the subject of RURAL ORNAMENT, spoken my sentiments freely on ornamental buildings.

In RURAL ECONOMY, straight lines and right angles are first principles, which can seldom be deviated from with propriety; either in laying out a farm, or in planning Farm Buildings.

Here the great object is to obtain the desired conveniencies at the least expence, present and future taken jointly, so long as the given conveniencies may be required. To these principles we may venture to add,—the greater number of conveniencies there can be included in one building, the cheaper will those conveniencies be obtained.

There is a certain width, which can seldom be exceeded with propriety, in Farm Buildings; but the nearer this width is approached, the greater quantity of conveniency will in general be obtained with a given expenditure. The long-cube form, with the plain span roof, can never be dispensed with, without evident impropriety, in constructing Farm Buildings

The number of Inclosures which have of late years taken place, and the spirit of improvement which has gone forth upon the wolds, have given existence to FARMERIES of almost every form and dimension.

The practice of housing cattle in winter, which will be spoken to hereafter, requires a greater quantity of building than that of wintering them in the open yard. But the quantity of barn-room requisite in this country, even on the arable farms, is much less than in the southern counties, where barley and oats are harvested loose, and where the shovel or the sail-fan is used in the dressing of corn. Here corn is universally bound, and the machine-fan is almost universal practice. In Norfolk, *one* man expects a floor of fifteen feet by twenty-four to himself; here *two* men will thrash contentedly on a floor nine feet by twelve; ten by fifteen is a full-sized floor.

Such being the requisites of a Yorkshire Farmery, it is no wonder that the new ones which have been erected should be composed of a string of small buildings, generally formed into a square, open to the south, in imitation of those of other countries where
cattle

cattle are wintered in the area between the buildings, not in the buildings themselves.

In one instance, I have observed the cattle hovels spun out in such a manner as wholly to inclose the dung-heap, excepting a gateway to get it out at. But the hovels in this case were only seven feet wide; not wide enough for cattle to stand across them; they being placed in them lengthway in pairs. The quantity of walling, the number of doors, &c. and the quantity of roofing, with the subsequent repairs incident to low straggling buildings, render this, and every other plan which resembles it, altogether ineligible in any District where cattle are wintered under cover. Wide houses, or open sheds wide enough to permit cattle to stand across them, are in many respects preferable.

In opposition to the Farm Yard last mentioned, there is, likewise in this neighbourhood, an instance of the entire Farmery (of a small upland farm) being comprised under one roof!

The site a long square. One end is occupied by a small dwelling-place for a "hind," or bailiff; the ground-floor of the remainder by a stable and beast-houses; over
which

which are a barn and hay-chamber ; with a CHAMBER-BARN-FLOOR ! a thing I had not seen, nor conceived an idea of, before I observed it, in more instances than one, in this District.

The above-mentioned is the only one I have seen in a *new* erection ; I have however had full opportunity of observing the use of another thrown over a cow-house ; in a large old building which had long been used as a barn, stable, and beast-house.

The advantages of a CHAMBER-BARN-FLOOR are dryness, cleanness from dirt carried in with the feet, and security against pigs, poultry, and other accidents to which ground-floors are more liable : for thrashing *wheat* upon, chamber-floors are obviously preferable to ground-floors ; most especially in low dirty situations.

No essential disadvantage has yet struck me respecting a chamber thrashing-floor ; but with respect to a CHAMBER-BARN, there is one which is obvious ; namely, that of having the corn at harvest, a busy season, to raise one story higher than ordinary.

If

If a barn be built against a rising ground, this objection falls in part, or wholly. Even on plain ground, it appears to me that (especially where cattle are housed) it would be greatly over-balanced by the advantage of obtaining a suite of stables, cart-house, and cattle houses, without the expence of roofing, in the first instance ; and which, if substantially built, would last for ages to come without repairs.

The flooring of a chamber-barn might on the whole be somewhat more expensive than that of a ground-floor barn ; but the thrashing-floors, if of plank, would be laid cheaper and last much longer, in the former than in the latter species of building ; and the mow-floors, if laid with clay on rods *, would soon regain their extra cost in keeping the bottoms of the mows dry and sweet ; and in preserving it more secure from vermin than ground-floors generally do.

It is far from my intention even to intimate that in corn countries, such as Norfolk, Kent, and other Districts, where cattle are

* NORF. ECON. MIN. 15.

wintered in yards, that chamber-barns would be universally eligible; but in a country like this, or in any country, or on any farms, on which grassland predominates, and where the housing of cattle is practised, I see no sufficient objection to chamber-barn-floors, nor to entire chamber-barns. On the contrary, it appears to me that on small grassy farms, in low damp situations at least, they would be found singularly eligible.

But although a close yard is unnecessary where cattle are housed, a single building, like that which was last described, is perhaps too simple to be altogether eligible; especially in an exposed situation, where some degrees of shelter are requisite.

Two buildings properly placed would give this necessary shelter: one of them a barn, with offices under it; the other, the dwelling-house, placed at right angles with the former: the two buildings touching at the corners only; forming a small yard with their ends, for hogs, poultry, &c. and a larger one with their fronts, for the dung-pit, &c. with a small arch-way communication between them.

This,

This, however, is intended by way of hint. To enter into the particulars of a plan which I have not seen executed, would be breaking into the design of the present work: nevertheless it might be wrong to suppress this idea (which struck me while I was sketching a plan of a Farmery on the above principles) with regard to ASPECT.

It is usual in planning a farm-yard to place the main line of building with its front to the south; in which case two wings become necessary to screen the yard from north-east and north-west winds: and perhaps this has established the common practice of inclosing a farm-yard on three sides with buildings.

But if instead of the back of a building being placed to the north, the angle of two buildings were directed to that point, the yard would be most effectually screened from the north, the north-east, and the north-west wind, without an unnecessary multiplication of low narrow buildings to eke out a third side with.

On a capital corn farm, on which a number of substantial buildings are required, three lines of building may be eligible; but

on any small farm, or on almost any farm on which grassland abounds, two lines of building, forming a chevron or carpenter's square, and placed with the *angle towards the north*, would, in my mind, be greatly preferable.

Another idea in RURAL ARCHITECTURE, new to me as that of a chamber-threshing-floor, I have seen executed in a substantial manner by two of the first occupiers in the Vale; namely, A GRANARY OVER A BARN-FLOOR.

In all other barns I have seen, the space over the floor, whether this be large or small, and whether the building be low or lofty, remains entirely useless*. The idea of occupying the lower part of this space with a cattle house, as well as that of filling the upper part of it with a granary, have perhaps been originally and recently struck out in this country.

In the two instances in which I have seen GRANARIES OVER BARN-FLOORS, the joists are supported by two beams thrown across the building, and the flooring of the granary

* Except in one instance, in which a very spacious building having been converted into a barn, joists were thrown across out of the reach of the flail, and the mows continued over the floor.

let into the walls at the ends; so that notwithstanding the granaries may be surrounded with vermin, they are proof against them.

In the floor is a trap-door with tackle over it, to raise and lower the corn from and to the barn-floor.

The height between the floors thirteen feet. This in my opinion is too great a height. Ten feet high is the most the flail requires*; and every inch above that height renders the granary in many respects less commodious.

Confining the dust, which always rises more or less in thrashing, appears to be the only objection to a BARN-FLOOR-GRANARY: I mean in a barn with pitching-holes to house the corn at. But if VENTILATORS were made immediately under the granary-floor, with valves to open or shut as the wind should change, the health of the thrasher would in all probability be less injured than it generally is by this laborious and unhealthful employment.

Indeed, in this country, where tall, wide folding BARN-DOORS are grown into disuse,

* See NORF. ECON. Vol. II. p. 67.

vent-holes of this kind are in some degree necessary to every barn-floor. Even upon the Wolds, a corn country, the use of large doors is declining: some good barns have lately been built with common-sized doors; one at each end of the floor: opening however in two parts, one above the other; so that the lower half can be shut to keep out pigs and poultry, while the upper one is opened to let in light and air.

This is a *fortunate* circumstance for the owners of landed estates: folding-doors large enough to admit a load of corn are expensive in the first instance, and frequently require repairs; besides the thrashing-floor, be it of what material it may, being liable to great injury in the act of drawing loaded waggons upon it.

Indeed, throughout, the YORKSHIRE BARN is characterized by economy. In Norfolk, barns of one hundred and fifty to two hundred pounds cost are not unfrequently built: here a very convenient one, and such a one as will satisfy a good tenant, may be built for forty or fifty pounds. What a saving is this upon a large estate!

The

The particulars which now remain to be noticed under this head are,

1. The method of laying pantiles.
2. The method of coping ridges and gables.
3. Eaves gutters.
4. Water cisterns.
5. Painting window-leads.
6. Mortar floors.

1. LAYING PANTILES. Formerly it was the practice to hang pantiles upon the naked spars, bedding their ends in mortar, and pointing them at the sides to prevent snow and rain from being beaten through between them.

This method had two evil effects: lime is liable to expand, contract, and perish with the weather; to which in this case it is fully exposed. The consequence was, if the cement laid fast hold of the tiles it broke them; if not, it slid from between them, and left the attic room exposed to the weather. The other bad effect of this method is, their being liable to be thrown off in high winds by the inward air being pent up, and finding an easy passage through this slight covering*.

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* See NORF, ECON. Vol. II. p. 84.

To remedy these two evils, it has of late years been the common practice to “sheet” the roof; that is, to interlath with plastering laths between the tiling-laths, and cover the entire roof with a sheet of lime mortar: and over this, to lay the tiles on “dry;” that is, without bedding or pointing them, being careful not to suffer any part of them to touch the mortar:—to prevent which a slip was nailed in between the spars and the tiling-laths to raise the tiles sufficiently above the sheeting.

This method, which has been practised some fifteen or twenty years, has been found effectual against the two inconveniencies above mentioned; but it has lately been found, that in twelve or fifteen years the laths begin to fail, owing it is supposed to their being exposed too near to the outward air; from which the lime alternately absorbing and imparting moisture, the laths become subjected to decay. I am rather of opinion, however, that this effect is caused by the tiling-laths; whose under-sides touching the plastering, check the descent of the rain

or

or snow water which beats in between the tiles. Or it may be owing jointly to the two causes.

Be this as it may, an improvement has lately been struck out which seems to bring the art to as great perfection as perhaps it is capable of being raised to. This improvement consists in nailing the plastering laths *beneath*, instead of *upon*, the spars; laying the main coat of plastering above the laths, between the spars; afterwards smoothing over the under-side with a thinner coat. This method removes the cement from the more immediate action of the atmosphere, gives a free circulation to the air and the water (which may be beaten in) between the tiles and the plastering; and at the same time gives neatness to the room beneath; without the expence, or the inconveniency, of a counter ceiling.

There is one very great conveniency arises from laying pantiles on dry. If by the wind, or by accident, a tile be thrown off or broken, it may be replaced by a plowman, as well as by a professed tiler: a conveniency, which
upon

upon a farm, perhaps, at a distance from workmen, is of no small value.

2. COPINGS. *Ridge Tiles*, being laid entirely on mortar, and being exposed in the fullest manner to the action of the winds, are very liable to be thrown off; as well as to be broken by the weather: it is no uncommon thing, in places where ridge tiles are used, to see half of them displaced or broken; the heads of the spars having nothing but the mortar to hide them, without any thing to defend them from the weather. The ill consequence is evident.

In this country where freestone, which will stand the weather, abounds, RIDGE STONES are in common use.

The form triangular; namely, half a square divided diagonally. The longest side is hollowed to receive the top of the tiles: the opposite angle forms the ridge. The angles at the base are generally dressed off, to prevent the wind from laying hold of them; and to give them a more snug and neat appearance. They are set on with mortar, in the same manner as ridge tiles are laid.

The

The *copings of gables*, let the walling material be what it may, is usually of dressed stone, supported at the foot by an ornamental bracket of the same, projecting ten or twelve inches without the side walls; giving a degree of lightness, and an appearance of consequence to the building.

The end of the first stone of the coping rests on this corner bracket; the others respectively on those next below them.

There is an evil effect attends the common method of putting on these copings: the ends of the stones being usually cut square, and flush with each other, to prevent their slipping, and to give them a smooth uniform appearance, the joints between them, when the mortar begins to fail, receive rain-water, and conduct it into the end wall, by which means their principal intention, the preservation of the wall, is rendered defective.

To prevent this effect, I have observed, in a few instances, an ingenious expedient practised. The upper ends of the coping stones are pared down to about half their common thickness (as from two inches thick to one), with a slope sufficient to give descent to wa-

ter

ter when they are laid upon the gable : the lower ends having notches cut on their under-sides, to receive the reduced points of the upper ends, about an inch beneath them.

By this expedient the water is effectually got rid of, without endangering the firmness of the coping ; but simplicity being by this means disturbed, the eye is displeas'd with what, however, is upon the whole a very valuable improvement.

On *this* side of the Vale, the morelands afford in great abundance stones well-suited to these purposes : but on the Malton side of the District freestone is less abundant ; nevertheless, such is the conveniency of inland navigation, the Derwent brings a supply of those useful materials ready dress'd and fitted for use. And now, when inland navigations are become so prevalent, there is scarcely a district in the kingdom which might not be supplied with them at a moderate expence*.

3. EAVES

* The price of the stones which are rais'd near Leeds, and carried by water down the Air, and up the Derwent to Malton, are as follow : *Ridge stones* fifteen pence a yard, or five pence a foot : *Copings* the same price : *Brackets* two shillings and sixpence each.

3. **EAVES GUTTERS.** The troughlets made use of to catch rain-water dripping off the eaves of roofs, are usually formed by nailing two narrow slips of board together: but eaves troughs made in that manner are liable to warp, and become leaky at the joint;—the bottom;—the most essential part.

Here, they are pretty universally hollowed out of one triangular piece of wood, with a round-mouthed adze. A piece six to eight inches square, slit diagonally, affords two triangular pieces fit for this purpose. The hollowing is not a work of so much labour as theory may suggest. They are usually made of deal. Gutters thus made are stiffer, and more easily supported,—are less liable to warp, and much less subject to leak than those made in the usual manner.

4. **WATER CISTERNS.** In Surrey and Kent there are instances of wells three hundred feet deep. The expence of tackle, and the expence of labour in raising water for every domestic purpose, and frequently for the use of stock, from this intolerable depth, would, it is natural to imagine, have long ago driven the inhabitants to some expedient for collecting

lecting rain-water : yet still they draw water out of the bowels of the earth ; or, in very dry seasons, drag it perhaps three or four miles up-hill in water-carts !

In the island of Bermudas, and in some of the West India islands, the inhabitants have (generally speaking) no other fresh water than that which they collect from the atmosphere in tanks ; and it is striking to see the small quantity of collecting surface requisite to the supply of a family with this necessary element ; a surface small in comparison with the roofs of a middle-sized farm-house and offices.

In this District, in which water-cisterns are growing into general use, especially in upland situations, I have seen an instance where the dwelling-house alone affords more than a sufficiency of water for every use of the family. Nor is it the conveniency of having a constant supply of water always at hand, which alone constitutes the utility of water-cisterns. Rain-water preserved in quantity under ground, is pure and palatable in a superior degree : cool in summer, and warm in winter. It is particularly grateful to cattle ; especially when they are ill : and it is highly probable

probable that, as a menstruum of aliment in general, it is the most *wholesome* water.

The *situation* of a water-cistern is generally under the kitchen, or in a vacant corner of the yard near the kitchen-door.

The *form* of water-cisterns is various. The deeper they are sunk, the better they keep the water. The cube is perhaps the most convenient figure; but a double cube would perhaps keep water better. A cistern nine feet cubical would contain twenty-seven cubical yards, or about sixty wine hogheads of water.

The *materials* of water-cisterns in this District are clay, bricks, and tarras.

The *method of making* has lately received a considerable improvement. When the art was less known than it is at present, an irregular hole was dug; the determinate figure of the cistern being given by the walls; behind which the clay was *rammed*. Now, the intended form of the cistern when finished, is given to the excavation; whose sides are squared and plummed with the exactness with which a wall is carried up. On this wall-like face of the excavation the clay is laid *plaster-wise* with a trowel, coat over coat,

two or three inches thick ; and against this firm even face of plastering the brick-work is raised. The bottom is, or ought to be in all cases, bedded with three or four inches thick of strong clay, beaten into a smooth even waxlike substance. On this flooring of clay a double floor of brick is laid ; and on the margin of this the side-walls are carried up half a brick thick. The bricks are, I believe, invariably laid in tarras.

The *covering* similar to that of a well ; with a pump, or a roller and bucket. The latter, perhaps, the more eligible ; especially if the admission-pipe were carried down to near the bottom of the cistern ; by which means the water at the surface would always remain undisturbed and pure.

5. PAINTING WINDOW-LEADS. This is not introduced as a thing of importance : but the practice seems to be peculiar to this country. It gives a degree of neatness pleasing to the eye ; and the paint is said to be a preserver of the lead. The colour invariably white.

6. MORTAR FLOORS. A new species of cottage-flooring has lately been thought of,
and

and is now pretty commonly made use of in this neighbourhood.

The *materials* lime and sand; mixed in nearly the same proportion, and prepared in the same manner as the common mortar of bricklayers; except, that for making floors with, it is generally made stronger, and is always made up softer than it is usually done for laying bricks in.

The *method*:—The bed being prepared, the materials are carried on, in pails, in a state between paste and batter; laying them on four or five inches thick, and about one inch higher than the intended height of the floor; to allow for their settling in drying. The whole being well worked over with a spade, the surface is smoothed with a trowel; and, as it dries, is beaten repeatedly with a flat beater, to prevent its cracking; the workman in this operation standing on planks.

A fortnight or three weeks of dry weather will render it stiff enough to walk upon.

If, after the last beating, cross lines be deeply graven on the surface, a floor of cement has the appearance, as well as the usefulness of a freestone-floor.

7.

DRINKING POOLS.

IN DISTRICTS abounding with upland grafs we may expect to find ARTIFICIAL DRINKING PLACES for the use of pasturing-stock ; but no District in the kingdom will gratify our expectations so fully in this respect as that which is now under observation.

In this country there are three species of artificial drinking places :

1. Standing Pools.
2. Artificial Rills.
3. Field Wells.

1. STANDING POOLS. The art of “pond-making” ranks among the most useful arts in Rural Economy. In many high situations no other expedient can be practised with propriety : rills cannot be raised ; nor wells sunk and worked, but at too great an expence for the purpose of watering stock.

On the hills of Surrey and Kent, ponds are made to hold water tolerably well with *chalk* beaten

beaten firmly together * : and in Norfolk, I apprehend, they have been formerly made with *marl*. In all countries where unfathomed beds of *clay* are common, drinking pools sufficiently retentive may, at a small expence and without much art, be formed ; and are in general sufficiently abundant.

But the art of making retentive pools with *CLAY*, in *loose absorbent soils*, is a recent discovery which has been hit upon in this District ; in which it has made a rapid progress, and is now in universal practice among farmers of every class. Indeed, for a country like this, where upland soil is kept principally in grass, it may well be considered as the most valuable discovery which has lately been made in Rural Economy †.

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* Experiments have, it is said, been tried with chalk upon the Yorkshire Wolds without success ; owing probably to the too great hardness of the Wold-chalk. A fat soft chalk is no doubt fittest for this purpose.

† FRANCIS and ROBERT GARDINER, well-diggers and fish-pond-makers, of Driffield, are entitled to much more than the *credit* of this discovery. The York Agriculture Society voted them a premium of ten pounds : were the nation to grant them ten thousand, it would not be more than they merit.

There is little difficulty in making a pit hold water with clay alone; provided it be kept up full to the brim; but once emptied, its retentiveness is lost. There are two causes of this loss of retentiveness:—the cracking of the clay by *drought*; and its being liable, whenever the water subsides, to be perforated by *worms*, which presently convert the basin into a filter, and for ever afterward destroys its retentiveness. It is therefore necessary that those two enemies should be guarded against.

To guard against the latter a coat of *lime* is spread under the clay: above it a coat of earth, and over all a covering of *stones* is laid, for the double purpose of guarding against drought, and for preventing the feet of cattle from injuring the **CLAY**; which alone is the cause of retentiveness; and on the proper working of which the art principally depends.

But many other particulars are requisite to be known before the art can be sufficiently understood to be practised with certainty.

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|---------------------------|--------------------|
| 1. The Run, or collecting | 4. Claying. |
| surface. | 5. Covering. |
| 2. The Reservoir. | 6. Time of making. |
| 3. Liming. | 7. Cost. |

I. THE RUN. A bare firm surface, as a *road*, collects the greatest quantity of water. A *grassy surface* retains the rain-water which falls upon it, and which in *level* situations is conducted into the soil by worm-holes and other inlets, with which grassland in general abounds; especially in summer, when a collection is of the greatest value. However, if the subsoil be retentive, *ditches*, especially of arable inclosures, will frequently afford a supply even in summer; but, in an UPLAND SITUATION, where the subsoil is generally absorbent, a *road*, or an *artificial run*, becomes necessary.

In highland Districts, as the Wolds of Yorkshire, and the Downs of Surrey and Kent, the surface is generally broken into hill and dale, and diversified by smaller valleys and inequalities. In situations of this kind ARTIFICIAL RUNS are most wanted, and may be most easily made. I have seen some faint attempts at making them on the Wolds of this District, by cutting a few grips with a spade above the reservoir; but they were too few, too short, and too seldom scoured to answer in any considerable degree the in-

tended purpose. They nevertheless shewed plainly enough the utility of channels for catching hasty showers falling on *grassy slopes*, off which a considerable quantity of water will escape, provided there be channels at proper distances to receive it.

To reap the greatest benefit from an artificial run, and to make it with the greatest ease,—form the basin at some considerable distance from the head of a valley; from which down to the reservoir open a main channel, by two furrows of a plow, turned outward. From this main stem plow lateral branches along the sides of the slopes, by single furrows, turned down-hill; by which means the plowing will be rendered easy, the channels made free on the upper sides for the admission of water, and high on the lower sides for retaining it. If the bottom of the valley be steep, it would be better to *reflect* the lateral branches than to shoot them upward, like the branches of a tree, toward the head of the valley.

The plow would not be less expeditious in scouring than in making the channels: or perhaps a more sledge-like implement would
be

be more effectual than the plow in closing the fissures and worm-holes which presently are formed in water-courses laid dry, and which, if left open, absorb an inconceivable quantity of water before they be saturated; especially if the current of water be retarded by grafs or other obstructions.

2. THE RESERVOIR. The *situation* of the reservoir depends principally on the run. Near the side of a road is in general the most desirable situation, provided a sufficient descent can be had from the road to the reservoir. Roads leading along the side of a slope can only afford a supply to the grounds on the lower side. But in this country, when a road leads down the descent, it is generally furnished on both sides with ponds; some of them perhaps not having more than a hundred yards of run off a narrow way; yet from that small quantity of surface are sufficiently supplied with water.

In the *situation* of a pond there is one thing requisite which does not seem to be attended to even by the most skilful in the art. The requisite I speak of is that of admitting a waste water-place on the upper side of the

reservoir, to prevent the water, when the pond is full, from running *through* it; by which means it becomes filted up unnecessarily. For the nature of foul water is such, that whenever it changes from a current to a stagnant state, it deposites a considerable part of its foulness; so that the water which runs out of a full reservoir is finer than that which runs in; the sediment of the surplus water being left behind in the pond. Whereas, if the current into the pond cease when the pond is sufficiently filled, the sediment of the overplus water is got rid of, the pond receiving in this case no other foulness than that which is given by the quantity of water which is required to fill it*.

The form of the reservoir is, universally, that of a shallow basin, or more strictly speaking that of an inverted cone; the sides shelving straight from the brim to an angle or point in the center. If the excavation be made sixty feet diameter, its greatest depth

* A small CATCH POOL, between the run and the reservoir, would arrest much of the foulness of water collected from a road; and, in a situation which would admit of it, would be worth the trouble of forming.

depth is about seven feet: if forty diameter, the depth is about five;—before the coats of clay, &c. be laid on*.

The first business in *setting out* a reservoir is to take the level of the site, and drive piles as a guide in forming the banks; and in making the conducting channel, and waste water-place

If the situation be on a *slope*, the excavated mould is used in forming the bank on the lower side: if nearly *level*, the mould requires to be removed, or (if laid round the edge) the conducting channel to be raised.

If clay or stone be excavated, it is laid separately aside to save carriage.

If the lower side be raised with the excavated materials, they ought to be firmly worked

* A reservoir set out twenty-two yards diameter, by seven feet deep, will, when finished, measure about sixty feet by six, and will hold about two hundred and ten cubical yards, or near seven hundred hogsheads of water. Forty feet diameter by four feet deep, when finished, contains sixty-two cubical yards, or two hundred hogsheads (of sixty-three gallons, wine measure).

worked together, or should lie a sufficient time to settle; otherwise the side thus formed is liable to settle after the reservoir be finished; by which means cracks are formed, and a miscarriage ensues.

The excavation having received the intended form, its sides are made firm and smooth for the reception of the lime.

3. LIMING. The use of lime being merely that of preventing earth-worms from perforating the coat of clay, the proper *quantity* depends, in some measure, on the nature of the soil. A fat rich earth, among which worms always abound, requires more than a dead hungry mould, or a dry stoney bottom; on which retentive pools are said to have been made without lime. However, as no soil, perhaps, is entirely free from those enemies, it would be folly to risque a miscarriage in any situation; as the expence of liming makes but a small portion of the whole expence.

The only *preparation* of the lime is that of falling it, and picking out the cores; no sifting or screening being, in general, used; though obviously useful.

It

It is usually *laid on* with a spade or shovel; but a riddle would, perhaps, be found by the inexperienced a better tool; and the extra labour no object,

The *thickness of the coat* laid on is about half an inch. Half a chaldron of lime is sufficient to complete a pond of forty feet diameter. The principal part of it is laid on beneath the clay; a few bushels only being reserved for scattering round the edges, to prevent the worms from getting *into* the clay*.

4. CLAYING.

* A still more secure, and on the whole a more eligible method of liming has lately been thought of, and is now (June 1787) in practice at Lockton (in this neighbourhood) by the Commissioners of Inclosure, in making public drinking pools for the use of the township. Instead of scattering the lime in powder, it is formed with sand into mortar; a regular coat of which is spread about an inch thick, not only beneath, and at the edges of the clay, but over the entire surface. This is an obvious improvement, which appears to human foresight to bring the art near to perfection. The clay becomes cas'd on every side with a regular coat of cement, and is thereby secured, in perhaps the completest manner possible, from the attack of worms. The labour and expence, however, is by this method increased. A pond nineteen feet diameter took two chaldrons

4. CLAYING. In this operation the manual art and the labour principally center.

Upon the Wolds, clay is sometimes fetched six or seven miles; and is seldom found at hand in situations where artificial pools are most wanted: the *carriage* of the clay, therefore generally, becomes a heavy article of expence.

The *choice* of clay is thought to be less essential than the working of it. Good ponds are said to have been made with common loamy mould; but it is wrong to depend on any thing but a strong ductile clay, if it can be had within a moderate distance.

The *thickness of the coat*, now pretty generally laid on, is about five or six inches in the rough; beating it down to about three inches. In the infancy of the art, two coats of clay, of about that thickness, were laid on; but one coat has been found effectual, and

drawn and an half of lime, and five small cart-loads of sand. Both the materials were sifted, and worked up in the usual way into mortar. Great caution is necessary in laying on the clay in this case. If the mortar do not lie some time to stiffen, the clay displaces it: if it get too dry before it be covered, it is liable to crack,

and much less expensive. However, it is probable, it will not prove so durable.

The *method of beating* will be difficult to describe ; yet it most especially requires description.

The *drier* the clay is worked, the less liable it will be to crack with drought when finished. In a dry season, however, it is necessary to moisten it : for which purpose the center of the pit is sometimes finished, first, to collect the water of showers ; the carriage of water being, in some cases, expensive.

In *laying on* the clay, the workmen begin at the bottom of the pit and work upward ; laying patch after patch, or circle after circle, until the brim be reached ; taking great care not to carry on sticks, straws, dirt, or any kind of foulness among the clay, or with their feet ; and being careful not to displace the lime in throwing it on : to prevent which the lime is not spread over the whole at once ; but is scattered on as it is wanted to be covered with the clay.

The plot of clay laid on and adjusted, it is *beaten* flat, with a wooden "meil," or beetle,

beetle, made, at present, of these dimensions : the head fourteen inches long, and three inches diameter ; the handle four feet long, and suited in thickness to the hand of the workman. Beetles of different sizes have been in use in different stages of the art ; but none of them so well adapted to the operation as that in use at present.

The first beating is given with the *side* of the beetle, to level the protuberances, and smooth the roughnesses, so as to make the whole into a regular sheet of an even thickness.

This effected, it is beaten forcibly with the *end* of the beetle, which is struck down nearly, but not quite, to the lime ; leaving the surface full of somewhat honey-comb-like cells or dints. If the beetle be struck unguardedly quite through to the lime, a piece of clay, and a little lime, if required, is carefully placed in the breach, to prevent a defect in the part thus injured.

The whole being gone over in this manner with the *end*, the surface is again levelled down with the *side* of the implement ; the workman walking backward.

The

The next beating is with the *end*, but not quite so deep as before; and the roughnesses being again levelled with the *side*, it is again worked over with the *end*; but still shallower than in the middle beating.

The first strokes with the *end* of the beetle ought to close the bottom of the clay firmly with the lime and the bed on which it is spread;—the second ought to unite the middle of the clay with the bottom;—and the last to close, without a pore, the upper part with the middle;—and the last strokes with the *side* of the beetle ought to be sufficiently forcible to close entirely the dimples formed by the last-given strokes with the end.

If these several beatings be thought insufficient, it is continued to be worked with the end and side of the beetle alternately, until not a flaw can be found; the entire coat of clay being worked into a lead-like sheet, firm enough to bear a man without an impression, and a horse without injury*.

5. COVERING

* When two coats of clay were in use, the upper one was laid upon the rough surface of the last-end-beating; by

5. COVERING. The first coat is of common *earth*, to assist in keeping out the drought, and to make a bed for the stones; to prevent their piercing, and thereby injuring the sheet of clay. This coat may be three or four inches thick, according to the nature of the stones with which it is to be covered. If these be large and irregular, more earth is requisite than when the stones are small or flat. The leanest most infertile soil is fittest for this purpose. WORMS and WEEDS are equally to be feared; and a rich soil is genial to both. In this point of view two coats of clay are much preferable to a coat of clay and a coat of rich mould.

Pond-makers seem not to be sufficiently aware of the mischievousness of WEEDS: indeed some ponds will remain for several years in a manner free from them. But I have seen others in which weeds, even docks (near the edge) have grown luxuriantly. It is probable that the tap-rooted weeds strike
through

by which means the two coats became, by the subsequent beatings, incorporated in one thick sheet. A substantial method, this, of which the present appears to be rather a refinement than an improvement.

through the several coats; and, whenever the roots decay, a perforation must be left.

Mould taken from a dry sound highland situation is in all human probability less liable to propagate *aquatic* weeds than the earth of a low situation or a bog*.

The mould being rendered level and smooth, the *stones* are laid on: first covering the mould with the largest, laid with a flat side downward, to prevent their sinking down to the clay; and upon these laying smaller, until the coat be made five or six inches thick †.

A PAVE-

* I have observed an ingenious and simple method of keeping the weeds under; especially at the edges, where they are generally most abundant. Though all the sides of a drinking pool be open, cattle will go to particular places to drink; and in these places the weeds are trampled upon and killed. Therefore, to check the rankest, the parts which are most free are covered with thorns, while those which are weedy are left open for the cattle to drink at.

† *Straw* has been used between the clay and the stones; and, in the instance (mentioned in a foregoing note) in which an improved method of liming was practised, a layer of thick *sods* was laid grass-side downward upon the lime; and upon the sods about six inches thick of loose stones.

A PAVEMENT would be a more regular covering; and, if the stones were set in lime and sand, would not only prevent *worms* from getting into the mould and upper side of the clay when the pond happened to be dry; but would in all probability prevent *weeds*; and, when the pond required to be *cleaned* from mud, would be a regular floor to work upon.

The only objection I have heard made to PAVING the bottoms of ponds, is, that it would be a temptation to cattle to go into the water in hot weather; and, by standing there, would not only foul the water, but in time tread up the pavement, and injure the clay; whereas sharp loose stones prevent their going farther than the edge. If the stones made use of in a pavement were sufficiently large, the latter part of the objection would fall; and whether cattle standing in a pool in summer be detrimental or beneficial, may be a disputable point.

However, whether or not the inside of the basin ought to be paved, the rim should certainly be a broad smooth causeway, with a gentle grassy slope on the lower side; that
the

the cattle may approach the water without wading in dirt, to the injury of the bank; and without having sharp loose stones to walk and stand on while drinking.

A drinking pool, formed by a skilful artist, full to the brim, free from weeds, and smooth round the edge, is, in a green pasture ground, as agreeable an object as the eye can be entertained with.

6. TIME OF MAKING. Autumn is esteemed the best time. Drought and frost are both enemies to new-made ponds. In autumn, drought has generally abated, and a sufficiency of rain-water may be expected in this season, to fill them before frosts set in. A covering of *straw* over the stones is the usual guard against the extremities of seasons.

If a reservoir be formed in a slope, where the lower side requires to be raised with loose earth, it ought (as has been already intimated) to remain a considerable time to settle, before the coatings be put on: otherwise, it is liable to settle afterwards, and crack the clay. I have seen an instance of miscarriage through this neglect. If there be much

made-earth requisite to be raised, the excavation ought to be formed twelve months before the claying be done.

7. EXPENCE. Although it is now twenty years since the discovery was made, the art is still partially hid under the veil of mystery; and is not yet become familiar to common farm labours. In *this* neighbourhood ponds still continue to be made by men from the Wolds; all of them, in reality or pretence, pupils of the first inventors.

These men generally work by the gross; the price being in proportion to the diameter: but they seem to have no regular method of calculation.

Ten pounds were given, and may now be considered as a medium price for twenty yards diameter*; forming, claying, covering, and in general digging the clay, included: all carriage and extra labour being done by the employer.

A circle twenty yards in diameter contains in its area 314 square yards. Therefore,
each

* In the early days of the art, and when two coats of clay were used, twenty pounds were given for ponds of this dimension.

each square yard of *surface* costs, at this price, sevenpence half-penny.

The solid contents of a cone whose base is 60 feet diameter, and whose height is six feet, is 209.4 cubical yards; each of which costs, in the above instance, elevenpence-halfpenny.

Five pounds have been given for a pond twelve yards in diameter: which is tenpence-halfpenny each square yard of surface; and, supposing it four feet deep, two shillings each cubical yard of water.

Three guineas were given for forty feet diameter, and four feet deep, the excavation having been previously formed. This may be called four pounds for the gross; which is about sevenpence a square yard of surface; or fifteenpence-halfpenny each cubical yard of water.

The men in the last case earned about three shillings and sixpence a day, without extraordinary exertion. In the first mentioned instance, the same workmen did not (according to their own assertion) make more than two-and-sixpence a day. But a large

pond gives longer employment ; and the business of pond-making being uncertain and inconstant, travelling workmen can afford to make a large pond at a cheaper rate than a small one.

The *curve superficies*, or superficial contents of the *sides*, of a cone twenty yards in diameter at the base, and two yards high, is about 320 square yards. This, in making a pond of those dimensions, is *the quantity of coating* : for each yard of which near $7\frac{1}{2}d.$ was given in the first instance, and less than $7d.$ in the last. *Sixpence each square yard of surface to be coated, may perhaps be taken as a fair medium price.*

To ascertain the quantity of coating, measure the exact circumference or rim of the pit, when finally formed and adjusted for claying : this dimension multiplied by half the length (or depth) of the side (measuring from the brink, down the slope, to the center) is the quantity of surface to be clayed and coated. The digging would (under this mode of calculation) fall proportionally heavier on a large pond than on a small one ; but
this

this would be counterbalanced by the advantage abovementioned.

The quantity of clay used in the first instance was about forty cart-loads, fetched about three miles ; in the last, about fifteen loads, fetched one mile. The quantity of lime in the former case, one chaldron ; in the latter, half a chaldron.

From the sum of these particulars it is plain, that the larger the pond, the less in proportion is the expence. A reservoir to contain two hundred cubical yards of water requires little more than three hundred square yards of coating ; whereas one to contain only fifty yards of water would require one hundred and twenty yards of coating : consequently a cubical yard of the former would only cost (at ninepence a yard for manual labour materials and carriage) eighteenpence ; while the same quantity of the latter would cost near two shillings and sixpence.

The UTILITY of Drinking Pools requires not to be dwelt on : but the SUPERIORITY of pools made in the manner above described, to those which have formerly been made by some other art, or which have been formed by nature or accident, may with propriety be mentioned. During the dry seasons which

have prevailed of late years, it has been observed that new-made ponds retain a supply of water when the waters of other stagnant drinking places are dried up. This can only be accounted for perhaps by their perfect retentiveness, and by their being free from weeds, which convert to their own nourishment, and throw off daily by perspiration a great quantity of water. Upon the Wolds their excellency was most conspicuous:—while one man was driving his stock three or four miles to water, his neighbours, who had “made-ponds” upon their farms, were free from this inconveniency. In many situations artificial Drinking Pools may repay the expence of making the first dry season. Driving stock to distant water in hot weather, and in a busy season, is an expence and a detriment to the stock so driven, which it would be difficult to estimate.

GENERAL OBSERVATIONS.—On examining ponds in this neighbourhood, which have been made some years, the evil effect of *covering with loose stones* is evident.

For one, two, three, or more yards round their edges, according to the time they have been
 been

been made, the use they have been liable to, and to the steepness of their sides,—the stones are entirely displaced or trodden into the clay; which is by this means opposed to the feet of cattle, and to the open attack of drought and worms. For a while the clay, even thus exposed, preserves its retentiveness; but in time it is destroyed, and the most valuable part of the pond entirely lost.

This effect is so *probable*, so evident to be foreseen, that, on first reflection, it seems astonishing so unsuitable a covering should be universally adopted. A beast when it goes into a drinking pit necessarily throws the chief part of its weight upon its fore feet; which, in the act of drinking most especially, are placed as for the intention of forcing whatever they stand on down the slope toward the bottom of the pit. Upon loose stones laid on a steep surface, cattle cannot make a step, or move a foot, without producing this effect in a greater or less degree; and by repetition and length of time, the entire coat (except some few which happen to be trodden into the clay) must, in the nature of things, be forced into the center.

But

But this practice, evidently absurd as it undoubtedly is in *this* District, was first established upon the *Wolds*, whose *stone* is of a perishable nature; a species of *chalk*; which, on being exposed to air and water and to the treading of cattle, unites into a cement; which, forming a regular casing, preserves the clay from injury for a considerable length of time. *Loose chalk* as a covering was therefore a good thought of the first inventors (indeed upon the *Wolds* there was no alternative); and it is not to be wondered at that their pupils, mostly day-labourers, should imitate the practice, in this country, by making use of *loose stones*.

Perishable or *soft stones* of any species, a strong rough *gravel*, or even *sand*, would, I believe, be better than loose hard unperishable stones.

But in this neighbourhood where stones of various kinds abound; or in any country where stones of a proper size can be procured at a moderate expence; there appears to me to be no choice with respect to covering. A regular FIRM PAVEMENT, strong enough to bear stock without an impression,
would

would last through ages ; and although the expence in the first instance would be something more than that of loose stones, its durability would in the end doubly repay it, Even the Wold ponds, which have been made fifteen or twenty years, are many of them beginning to fail, and will in a few years require to be fresh coated ; whereas a pond properly paved would, in all human probability, remain perfect for at least a century.

There would be an advantage of a PAVED pond which may not strike every one. The clay and its coverings, while the pond is filled with *air*, appear to be a firm solid mass, which would require a great power to disturb it. But the pond being filled with *water* the texture of the clay is changed, and the relative gravity of all the covering materials considerably altered. They no longer adhere to the bottom with the same firmness, nor in fact lie upon it with the same weight, they did before the water was let in. For if instead of stone the clay had been covered with blocks of wood (for instance), whose specific gravity is less than that of water,

they

they would have risen to the surface, and have left the clay wholly exposed at the bottom : even stones themselves lie in water with little more than half their weight in air.

This propensity in the covering materials, when covered with water, to rise towards the surface, and the state of softness which the clay is reduced to by a free communication with the water, render them very liable to be disturbed by the feet of cattle ; thus exposing the clay to injury from above : while subterraneous water, after heavy rains, may insinuate itself beneath the clay, and not only disturb the lime, but raise up the clay, and assist in rendering the coatings still less firm ; or, in other words, in promoting the general tendency of the whole to form an artificial quagmire.

But if a pond were properly PAVED while the coats were yet in a firm solid state ; the pavement, being an inverted dome and acting as an *arch* against their upward tendency, would preserve them in that state so long as the arch itself should remain perfect ; which must of necessity be until the stones were worn out, or the foundation on which they rested should give way. For the
pressure

pressure of the feet of the cattle being directed towards the center, would rather *stiffen* than weaken the *arch*; while the swelling of the clay and the soil (if any), with the water which would of course filter through the pavement, would assist in promoting the general union.

If irregular rough pebbles were used, the flattest end should be placed downward to prevent their injuring the clay; and the point upward, to prevent the cattle from sliding into the pond while drinking; as well as from standing upon them after their thirst were quenched.

But stones hammered into a long-cubical form, like the Scotch stones now used in paving the streets of London, would make the firmest pavement; the upper edge being left rough for the purpose last mentioned.

It appears to me that a well-made pond paved in the workmanlike manner in which the streets of the metropolis are now in general paved, must of necessity remain perfect until an eruption of the earth, or a general dissolution take place: provided the rim were from time to time repaired, to prevent the feet of
cattle

cattle from breaking up the edge of the basin.

2. ARTIFICIAL RILLS. The Heights of the northern margin have neither springs nor rivulets (some very few instances excepted), nor any other *natural* waters than the brooks which wind at the bottoms of the deep vallies that divide them; and the rivulets which generally run at the feet of the precipices that terminate them.

Formerly these brooks and rivulets were the only resources which the villages that are scattered on these Heights had for water, both for the use of cattle and for domestic purposes.

In process of time wells were sunk; but they are of such a depth as to make the labour of raising the water little less than that of fetching it from a moderate distance.

This kind of natural necessity has led to an expedient, which, though not new in principle, is perhaps entirely so in simplicity of execution, and might be practised with great advantage in many similar situations.

The moreland mountains rise with generally an easy ascent, from the beds of the rivulets

vulets last mentioned to a height much exceeding that of the hills to be watered; frequently abounding with springs almost to their highest swells.

These springs are collected and conducted by a narrow channel down the slope of the mountain sides, and along the face of the precipice, until the summit be gained; the waters being thence conveyed to the place or places desired.

In *planning* an artificial rill, a level and some little knowledge of the country are the requisite guides. The surveyor begins at the place to which water is required to be brought; and ascertains the lowest part of the brink of the precipice from which water can be conducted. The face of the precipice is traced in like manner; and, if necessary, the ascent of the moreland hills; until springs, or their natural rills, can be commanded.

If his level bring him to the bottom of the steep soon enough to catch the rivulet which runs at its foot, the work is readily completed. If not, he goes above its highest bend; generally to the head or highest part
of

of the valley (between the heights and the morelands) and winds along the side of the opposite swell to some more elevated source.

If, when he arrive on the moreland hills (or by an observation from the top of the precipice) he find that nature does not furnish the requisite quantity of water high enough to give the necessary fall, the work is of course impracticable.

In *executing* an artificial rill, opening a shallow channel, of a width proportioned to the quantity of water to be conducted, is the main operation. In making *stagnant pools* we have found that much art is necessary to make them retentive; but in forming the bed of a rill no such art is requisite. It is the nature of *running water's* to render the surface on which they run firm and retentive. *Sand* is, I believe, the chief material used in forming the channels of these rills; and this only in places where an open rock or other porous stratum is crossed.

Much however depends on the quantity of *fall* and the quantity of water. If the fall be but little, and the quantity of water at the source be such as not to admit of much waste,
great

great care is requisite in forming the bed of the rill.

The *fall* is therefore regulated in a great degree by the quality of the *ground*. On good ground the channel is nearly level. Over faulty ground the water runs with a current; for the double purpose of getting quickly over it, and rendering its channel the more retentive.

The principal *enemies* of artificial rills are leaves in autumn and snows in winter. To remove the obstructions which these not unfrequently cause, and to repair such breaches as time will always make in the works of art, a *superintendant* is necessary to every artificial rill.

THE RILL OF KIRBYMOORSIDE is, I believe, the largest, and was the first, which was brought upon these Heights*. Since the introduction of this, several others have been

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raised;

* This rill was brought to the villages of Gillimore and Fadmore near forty years ago; and has been extended to Kirby about thirty years; by JOSEPH FORD; a self-taught engineer, of great ingenuity and some judgment; a man to whom the country *owes* much.

raised ; and some few unsuccessful attempts have been made : the channel was in one instance (that of *Newton*) extended a considerable way before the impracticability of completing it at a moderate expence was discovered ; a piece of misconduct which nothing but a want of accuracy in the use of the level can lead to*.

The *first cost* of Kirby-rill was not altogether one hundred pounds. The *distance* about ten miles : watering (besides the town of Kirby) two villages, and a line of cultivated waterless upland country about four miles in length.

Besides

* The miscarriage in this case was not owing to a want of elevation in the source, but to a depression of the channel at the foot of the steep ; the head of the valley (if such it may be called) being lower than the top of the precipice at the given point. This shews the necessity of tracing the entire channel with sufficient accuracy before any other expence be incurred.

In the case of Kirby the channel is raised some feet by a bridge-like mound of earth thrown across the crown of the valley.

The same mound serves the purpose of conducting another rill across the same difficult pass ; from whence the Kirby-rill takes an eastward, the rill of *Wellburn* (applied principally to the watering of pasture grounds) a westward direction.

Besides the first cost, which was raised by subscription, a *superintendent* has ten pounds a-year for keeping it in repair and free from obstructions ; which yearly salary is paid by the voluntary contribution of the persons benefited ; each being rated agreeably to the estimated benefit received*.

3. FIELD-WELLS. The skirts of the margin, formerly arable fields, but now grassland inclosures, were on their first inclosure equally destitute of natural and artificial watering places. Water for stock, however, was in a degree necessary ; but the art of pond-making was not then known. Wells were therefore sunk : the depth twenty to thirty feet, according to situation. The water is raised either by a pump or by a roller and bucket. The reservoirs stone-troughs. Sometimes the well is sunk in the line of a fence, supplying two fields with water.

In situations which are low and flat, yet dry, pools are difficult to be filled ; and wells of course more eligible. They are readily sunk, and seldom dry, in such situations.

N 2

ROADS.

* In a bill which is now before Parliament for inclosing the commons and remnant common fields of the township, a clause is wisely inserted to establish a *legal assessment* for the preservation of this rill.

8.

R O A D S.

THE SPIRIT of improvement has in no particular made greater exertions than in the FORMING OF ROADS. Within my remembrance all the roads of the District lay in their *natural* form; that is, in a state of flatness, in flat situations; or in hollow-ways, on the acclivities of hills. Now there is scarcely a flat road or a hollow-way left in the country. The more public roads at least are now universally *barrelled*; the banks of the hollow-ways having been thrown down, and the flat roads raised into a CONVEX FORM.

Formerly the sloughs and inequalities were filled up with a soft sort of gravel, which being soon reduced, or sinking in the mire, only added to the quantity of dirt and the heaviness of the road. Now the universal COVERING on this side of the Vale is LIME-STONE broken into small pieces, affording a rough but durable road.

But

But notwithstanding these exertions, and the quantity of labour and money which have been expended on these alterations, the roads are still far from being commodious, or even safe. The same folly of doing over much, which discovers itself too plainly in the roads of almost every District of the kingdom, is here manifest.

Roads can scarcely be *raised* too little: a *gentle descent* for rain-water is all that is requisite or useful, and constitutes the sole intention of raising them. And the only *drain* the side of a road requires is a mere channel, with out-lets, to prevent the water, thrown off by the road, from collecting by the side of it.

Therefore, IN FORMING A ROAD, all the preparation requisite (previous to the covering) is to form such a channel on either side, by paring down the *outer edges* of the *site*; casting the soil into the margin, or carrying it off for some useful purpose. Not a spade-full of earth should be thrown into the middle of the site, except to level inequalities. The *convexity* (the slope formed by the paring on either side excepted) should be given entirely by the stones or other hard materials;

which ought to be laid on a *firm surface*. If the site be naturally unsound, the soil ought to be removed, or to be made firm by under-draining. For until a FIRM FOUNDATION be obtained, it is highly imprudent to be at the expence of laying on a covering.

Nevertheless, a general method of RAISING ROADS in this and almost every other reclusive District, is to dig a *deep ditch* on either side; to cast the loose earth into the *middle of the site*; and on this to pile a *narrow high ridge* of hard materials. The effect is, carriages being necessarily confined to one track upon the ridge of the road, the stones which are not pressed into the loose dirt beneath, are soon cut through by the wheels always passing in the same ruts, through which the artificial bog below soon rises to the surface.

The method of REPAIRING is equally absurd. Instead of the ruts being closed, by pecking in the ridges on either side of them, or by filling them with a *few* additional stones; the entire road-way is covered with a *thick coat*: and so often as fresh ruts are formed, so often is this expensive and therefore doubly absurd method of repairing repeated: until
having

having laid coat over coat, and piled ton upon ton unnecessarily, a mound of earth and stones, resembling the roof of a house rather than a road, is formed.

THE FORMING and REPAIRING of ROADS incur a heavy tax on landed property ; and the SAFETY of roads is a matter of public concern.

Some years ago the Legislature paid considerable attention to this subject, and extended their authority perhaps as far as could be done with propriety.

It might be difficult perhaps to frame a *general law* for the FORMING of Roads ; because different situations require different FORMS. In low situations a common-shore or a ditch by the side of a road may be necessary ; but in absorbent upland situations neither of them are admissible : the road ought to fall gently to THE FOOT OF THE HEDGE-BANK ON either side, when it leads through a lane of a suitable width ; or to THE FOOT OF A MOUND OF EARTH, raised (with the parings of the road) for the purpose, when the lane is too wide, or the road passes over an open country. In low retentive situations, where deep DRAINS

are requisite, similar mounds ought to be formed, as GUARDS to the SHORES or DITCHES behind them; openings being made at proper distances for the water collected by the road.

The CONVEXITY of a road ought to be such as will throw off the rain-water which falls on it, without endangering in any degree a *top-load*.

Before a TOP-HEAVY LOAD can be *overturned*, the entire weight must be thrown upon the wheel or wheels of one side; consequently the nearer it approaches to the dangerous equipoise, the greater injury the road will receive.

Thus, suppose a loaded waggon to weigh two tons. Upon level ground each wheel would sustain half a ton; but upon a shelving road, steep enough to bring the load to the equipoise of overturning, the entire weight would rest upon two wheels only, each of which would in this case sustain one ton; consequently, if we reckon pressure as injury, the damage done by a carriage at the point of overturning is twice as much as that which is caused by the same carriage on level ground;

ground ; and the nearer it approaches to one or the other of these extremities, the more or less injury the road will sustain by it.

Nor is the injury the road itself is subjected to the only evil effect of a steep-sided road. The ADDITIONAL FRICTION which is thereby caused between the inner naves of the wheel and the body of the carriage, &c. (or between the iron-work which severally belongs to them) gives an addition of *resistance to the team* ; whose extraordinary exertion on this account is at once injurious to themselves and to the road.

Most of the ROADS about the METROPOLIS, and many parts of the GREAT NORTH-ROAD between Gunnersberry-hill in Lincolnshire and Ferrybridge in Yorkshire, are, for road-surveyors, proper subjects of study.

The surveyors of roads, in general, are as uninformed, or as inattentive, about the REPAIRING of roads as they are about the forming of them.

RUTS are the principal enemies of a *barrelled* road. On a *waved* road they serve as conductors to convey off the water : but on

a *convex* road the descent of the water ought to be immediately from the crown to the channels on either side.

The great art, therefore, in the MANAGEMENT OF CONVEX ROADS is to form them in such a manner as to *prevent ruts* as much as possible; and, if they appear, to be attentive in *doing them away* before any material injury take place.

The obvious method of PREVENTING RUTS is to keep the road low at the crown, and guarded at the edges; so that even top-loads may be drawn over *every part* with convenience and safety.

Upon the roads above specified it would be difficult to endanger the most top-heavy load; except by running wilfully upon the hedge banks. *Every foot, from side to side, is travelable road*; and every part impartially travelled over.

On the contrary, upon the ridged-up roads of this and other countries, the driver of a top-heavy load *dare* not leave the top of the ridge; and the drivers of loads which lie lower, for a variety of reasons, follow the beaten track: even horsemen who are timorous

rous are *afraid* to leave it ; and those who are not so, pursue it for obvious reasons ; no other part of the road being beaten, or convenient to travel upon.

Of a road properly formed, the immediate channel on either side (being a species of *wash-way*) is frequently the cleanest, firmest, and, if freed from stones and other obstructions, the pleasantest HORSE-PATH. But who possessed of common prudence would ride upon the tender brink of an unguarded ditch ?

The effect is notorious : horses and carriages of every kind are equally confined to the same narrow track upon the ridge ; frequently consisting of two ruts and a middle path, with no better *quatering* for horses which draw double, than there is in a narrow green-lane, or over a rutty common.

The method of KEEPING CONVEX ROADS IN REPAIR is not to permit them to be worn into ruts and holes until they be impassable ; and then to plaster over the whole surface, sound or unsound, with a thick coat of materials ; but to pay, from time to time, due attention to the wearing of them.

Ruts and hollows, which are yet too shallow to require to be filled in, should be opened on the lower side to prevent water from standing in them; but such as are too deep for this operation, should be levelled in without loss of time.

Upon *stone roads*, this may frequently be done by collecting *loose stones*, and chipping off the neighbouring *protuberances* (equally *dangerous* on the surface of a road) and burying them in the hollows to be filled up; thus removing two principal evils of stone roads in doing away a third.

But additional materials being in many cases requisite, they ought to be laid ready in proper recesses; for the purpose of levelling inequalities as fast as they are made; and thereby preventing the evil effects of the worst enemy of a well-formed road,—*standing water*.

The road between Lynn and Wisbech, over the marshlands of Norfolk, is formed entirely of *silt*, a species of sea-mud, so fine as to be scarcely palpable; nevertheless, with the precautions of *keeping the surface free from standing water*, and of *levelling in the*

ruts

ruts and hollows, with a hoe, *so fast as they are formed*, it is, in wet weather, one of the finest roads in the kingdom.

I have observed, in other parts of the island, roads, covered with nothing but common *sand*, kept in good condition by the same easy means. And the roads which have been held out as patterns are all managed, whether of *gravel* or of stone, in a similar way.

Indeed, all well-managed TURNPIKE ROADS have men *constantly employed* upon them for the purpose of *repairing small breaches, in order to prevent large ones*; and every TOWNSHIP ought to employ a ROADMAN OR WORKING-WAY-REAVE, one or more days in each week throughout the year, for the same excellent purpose.

Instead of exhausting the whole of the statute duty (as it is called) in laying on coat upon coat, at some certain season of the year, and letting the roads lie until the return of that season, as much neglected as if they did not belong to the township;—such parts, only, as are worn too thin, should be covered: a sufficiency of materials being reserved,
and

and distributed in the most convenient manner, for repairing occasional breaches.

Before I close this section, two particulars require to be spoken to :

The width of roads ; and

The height of hedges on the sides of roads.

The Road Acts, passed in the thirteenth year of the present reign, order that every “ horse or driftway ” shall be made eight feet *broad* ; and every “ cartway ” leading to a market town, shall be twenty feet *broad* ; that the *lane* of every “ highway ” shall be thirty ; and the *lane* of every “ turnpike road ” shall be sixty feet *wide* ; without specifying any particular *breadth of travelable road*.

In some few situations, as in the bottom of a narrow valley between two hanging woods, and where a common-shore and a mound of earth are requisite on either side of the *road*, a *lane* sixty feet in width may be in some degree necessary. But, in ordinary situations, that width incurs a *waste of land* without any adequate advantage. Indeed upon mountains, and in other exposed situations, the traveller is thereby deprived of the *shelter* which a closer *lane* would afford him.

Nor

Nor does the loss of culturable land, and the circumstance of exposing travellers unnecessarily to the inclemency of the weather, constitute, in this and other cases of a similar nature, the sum of impropriety; *grassy lanes* are the greatest nuisance an occupier of land can have in his neighbourhood: and it would be well if some *general law* could be instituted for their regulation.

In the last section it was mentioned, that in the *Sinnington Inclosure Bill*, an admirable clause is inserted respecting the grass of the roads to be set out. For the first ten years, no stock whatever are to be *turned loose* into them; nor, after that time, are they to be *common*; the surveyors, for the time being, having a power to *let* them, and *apply the rent to the repair of the roads of the township*.

With respect to the drying of roads after rain, more depends on the HEIGHT OF THE HEDGES than on the width of the lane. The crown of a barrelled road thirty feet wide, with hedges kept down to four feet high, will dry nearly as soon as if no hedges were near it, and much sooner than a road in the middle of a lane sixty feet wide, with hedges
and

and perhaps a line of stubwood, as may frequently be seen, thirty or forty feet high, rising on each side of it, depriving the road entirely (unless when the wind happens to blow lengthway of the lane) of a free communication of air.

In low, and indeed in ordinary situations, high hedges on the sides of roads are doubly hurtful: they are not only injurious to the road itself, but, in close weather, are offensive to the traveller, and very injurious to the beasts of burden and draught which are employed upon them. The Highway Act therefore wisely orders, "that the possessors of
" the land next adjoining to every highway
" shall cut, prune, and plash their hedges."

But this salutary clause has hitherto been very little attended to. In many counties it would be difficult to find an instance in which it has been obeyed or enforced.

The magistracy of this county, however, may claim superior merit in this respect. The road between York and Doncaster, near forty miles, is singularly well kept in this particular: scarcely one licentious bush is left:

and

and many of the less public roads of the county are laid open in a similar manner.

But excellent as this regulation undoubtedly is, in low as well as in ordinary situations, more especially where roads lead through old inclosed countries, in which lanes are frequently too narrow; it would, nevertheless, if indiscriminately enforced, be greatly detrimental in wide lanes and exposed situations; where *shelter*, rather than a current of air, is desirable.

However, the execution of this law being in the hands of magistracy, its evil tendency may be easily checked, without injuring in the least its more general intention.

9.

F E N C E S.

THE PARTICULAR articles which require to be noticed under this head are,

- | | |
|---------------------|---------------------|
| 1. Gates, | 4. Dead Hedges, |
| 2. Fence-Walls, | 5. Live Hedges, |
| 3. Posts and Rails, | 6. Hedgerow-timber. |

1. GATES. The common field-gates of this country are, in general, made *slighter* and much *taller* than those of other Districts. In Surrey and Kent; three feet eight or nine inches is the ordinary height of a gate; which is there composed of four common bars, and a strong top rail. Here, gates have generally six or seven bars, all equally slight; and the common height five to six feet.

HORSES are the greatest enemies of gates. A low gate, let its strength be almost what it may, is no fence against a resolute powerful horse. If he can place the *muscular part of*
his

his chest firmly against the top-rail, scarcely any strength of wood can resist him. But if the top bar be placed high enough to receive his *windpipe* instead of his chest, his power of injuring the gate is in a manner wholly taken away. It is therefore no wonder that, in a country where the breeding of horses has long been a common practice, HIGH GATES should have grown into common use.

THE HANGING OF GATES is an art little understood even by the hangers of gates themselves, though highly interesting and useful in Rural Economy.

A person here who has paid unusual attention to the subject, and who has in reality made himself master of it, still continues to hang his gates upon *pivots* fixed at the feet of the hartrees*.

This was undoubtedly the original method of hanging gates, and is perhaps, all things considered, the best.

It is probable, that in the infancy of the art the foot of the hartree was itself formed

O 2

into

* HARTREE; the principal end-piece, into which the bars are mortised, and by which the gate is hung: opposed to the HEAD, the other end-piece.

into a pivot, while the upper part of it was confined to the post, or perhaps to a tree, with a rope or a withe.

In the instance under observation, the upper part of the hartree is hung in the usual manner with a hook and eye; and the foot of it is shod with a PIVOT OF IRON, set upon a large *hard stone*.

The great ADVANTAGE of hanging gates ON PIVOTS is that of their being *readily altered* with respect to *fall* or *catching*: moving the pivot-stone a quarter of an inch this way or that with an iron crow, is frequently a sufficient regulation: the pivot, too, takes part of the *weight* of the gate.

But gates to be hung with pivots require a peculiarity of CONSTRUCTION. Every gate when shut ought to hang *plumb* and *level*; that is, the head should be every way upright, and the bars horizontal.

This requisite however, and at the same time a proper *fall*, cannot be had in a gate made *in the square*, and with a *straight hartree*. Either the lower part of the hartree must be *crooked*, or the gate must be made *out of the square*; that is, the bars must stand somewhat obliquely,

obliquely, not perpendicularly to the hartree ; and in *this* case the pivot must be placed not in the center, but on the *outside of the foot* : the first to throw the point of the pivot *behind* the pin of the upper hook, to give the gate a fall when open at right angle ; and the latter, to throw the point of the pivot *without* the pin of the hook, to give the gate a fall at the post, and make it catch with certainty.

This being understood, it is easy to conceive that if the lower end of the hartree be crooked, and if the elbow or convex side of the bend be directed not to either post, but towards the middle of the gateway, the necessary falls may be had without throwing the gate out of the square, or the pivot out of the center of the hartree.

I mention this method of hanging gates the rather, as, notwithstanding its advantages, it is grown into almost total disuse ; owing, it is very probable, to a want of knowledge of the proper principle of construction. I shall, in another place, have occasion to speak fully of the method of *hanging gates on hooks*.

2. FENCE-WALLS. The common homestall fence of this District is *wall*; either of brick or stone.—*Battoning*, in the Norfolk manner, is unknown, and close *paling* seldom made use of.

In the morelands, and upon the limestone heights, stone walls are the common field-fence. Live hedges are in these situations slower of growth, and more difficult to raise, than they are in warmer better soils; whereas stones are plentiful, lying in some places an incumbrance to the surface.

Inhospitable and unornamental as naked stone-walls may seem, they are in many situations the most eligible fence:—cheap and durable.

They are of two kinds, “double” and “single:” the latter, which are composed of single stones piled one upon another, are a sufficient fence against stock, provided they be raised high enough; but are liable to be thrown down by the wind. The former, which are built in the common wall manner, but without mortar, are more expensive in the first instance; but if properly raised, will endure for ages with little or no repairs.

The

The MODERN FENCE-WALL, of which many miles have been built in consequence of the new Inclosures which have lately taken place, is of the following form and dimensions.

The *height* five feet. The *width* at the base twenty-two inches, narrowing to sixteen inches at the top; which is *coped* (as a guard against sheep) with the widest and flattest of the stones laid aside for this purpose.

A frame of wood of these dimensions is set up as a *gauge*, and as a guide to the builder.

The lowest *price* which has, I believe, been given for raising, carriage, and walling, is five shillings and sixpence for a rod of seven yards. But a shilling a yard may be taken as a more medial cost. Each yard takes about a three-horse cart-load of stones.

3. POSTS AND RAILS. In most countries, the prevailing *temporary fences* are hurdles. Posts and rails are only used for the defending of young hedges, and for other permanent purposes; being generally put down by a carpenter, and are seldom removed until they become useless as a fencing material.

But here they are considered in a different light. They are (speaking generally) the only

temporary fencing made use of. If a piece of ground require to be divided, for one season or for a few weeks, a line of posts and rails are run across it; not by a carpenter, but by a common farm labourer. And when the purpose is answered, they are removed and laid up for another occasion.

I mention this circumstance as posts and rails are more durable, and a much better fence against horses and cattle than hurdles are; and the labour of putting down and removal is much less than inexperience may imagine.

4. DEAD HEDGES. The *stake-and-edder* hedge prevails in this District, and is in general constructed with uncommon skill. The superiority of construction lies principally in the *eddering*.

In other places the EDDERS are *trimmed* up to naked rods: here the spray towards the top is left on. These sprayey tops being wound round the bodies of the succeeding edders make them lay hold of the stakes, thereby preventing their rising. If the twigs of the edders be insufficient, brambles or other pliable brush-wood is wound in with the same intent.

But

But the most effectual way of preventing cattle from throwing off the EDDERS, which method is here sometimes practised, is to carry on the two operations of eddering and filling together, *burying the sprayey tops of the edders among the filling*; by which means they are effectually secured from the horns of cattle; and even while they remain sound, from the hands of hedge-breakers.

5. LIVE HEDGES. The management of hedges appears to me a matter of so much importance in the management of an ESTATE, and is a subject to which I have paid so much attention, that I always find it difficult, whenever I sit down to write upon it, to confine myself within due limits.

In this District I find ample matter to animadvert upon. The finest hedges in the kingdom (if any one particular spot can claim a superiority) are now growing in *this* neighbourhood; and more new ideas respecting the management of hedges have occurred to me in the District now under notice, than in all the others I have visited. It would therefore be wrong to treat the subject slightly in this place. But I will endeavour to
compress

compress the matter which I have accumulated within as narrow a compass as may be.

The sub-divisions which the subject in this place requires are :

1. The species of hedgewood.
2. The method of planting new hedges.
3. The method of defending them.
4. The method of cleaning and training.
5. Their after-management.
6. The treatment of old hedges.

1. The prevailing HEDGEWOOD is *white-thorn*. Formerly it was in this, as in other places, gathered in the woods and rough grounds. But at present, and for some years past, “garden quickwood” has been pretty generally, though not yet universally planted.

But although the white-thorn is the common hedgewood of the District, and, in ordinary situations, may be the most eligibile, I have seen *crab-tree* used in cold soils, as well as in bleak situations, with great success. In an instance where crab-tree and white-thorn were planted alternately, by way of experiment, the crab-tree plants have outgrown those

those of the thorn in a striking manner. In six years they have acquired stems as thick as the wrist, with tops sufficient as a fence against ordinary stock.

Upon the Wolds I have observed the *elder*, a plant which braves the bleakest situation, made use of as a hedge-wood ; but never saw it planted with sufficient judgment to answer the intended purpose. Nevertheless, in the abundance and luxuriance of this plant upon the most exposed parts of the Wolds, it is evident that, with proper management, it might be made at least a skreen to better hedge-woods.

The *holly* I have seen raised (in the practice of a man who has paid great attention to the business of hedge-planting, and in this particular with great success) with an unusual degree of rapidity and certainty.

The secrecy of the art lies in the *time of transplanting*: a holly transplanted at Midsummer scarcely receives a check from the removal ; a fact, this, which few planters are aware of.—Thousands of hollies are every year destroyed by removing them in the winter months.

2. PLANTING. The common *method* is to turn a sod, ten or more inches wide, upon the brink of the intended ditch, and, behind this, to set the plants in a leaning posture; covering the roots with some of the best of the mould the ditch affords; and, behind the plants, to lay the remainder of the excavated earth, in a low broad bank.

The ordinary *ditch* is very small; barely affording mould to back up the plants with. Neither the ditch in front nor the bank behind are considered, as they are in Norfolk, a guard to the young hedge.

The Pickering INCLOSURE BILL orders, that the ditches in the *lower grounds*, when they are necessary as drains, shall be made four feet wide, and two and a-half feet deep. But for the *uplands* no limits are prescribed; the distance between the outer brink of the ditch and the line of hedge-wood being the only thing limited. This width is fixed, throughout, at four feet and a half. In this case, the outer brink of the ditch being the boundary line of each man's property, a slip
of

of whole ground is left between the inner brink and the first-turned sod.

One deviation, however, from this general mode of planting under the Inclosure Bill occurs. In this instance, a narrow trench only is dug against the boundary line; leaving sufficient room between the inner brink of the trench and the line of quick to place the dead fence; by which means the owner of the land, getting his young hedges within his own premises, is no way liable to the ill-nature or negligence of his neighbour. And, instead of laying in the plants behind the first-turned sod, the ground is dug four or five feet wide, and the plants set in a trench upright in the nursery manner, having, in this case, a line of prepared earth on either side to feed among.

Nor is this the only instance I have met with in the District of PLANTING HEDGEWOOD ON A LEVEL. The same judicious planter has, in dividing upland inclosures, planted hedges without any ditch whatever. His practice has been to plow a slip of ground, on each side of the intended line of the fence,
the

the preceding spring; and having previously dunged it, to plant it with potatoes. During summer the land is repeatedly cleaned with the hoe; in autumn, the potatoes being removed, the entire slip is gathered into a ridge with the plow; and the ensuing spring the quick is planted, nursery-wise, in a trench run along the middle of the ridge. The success of this method has proved equal to what might be expected from management so obviously judicious.

Another new idea, which has been struck out and carried into practice by the same person, is that of SORTING HEDGEWOOD PLANTS: not according to the thickness of their stems; or the size of their tops, but agreeably to the strength of their roots. When the plants are put in, indiscriminately, the strong soon outgrow and overpower those which are weaker. But plants which are judiciously sorted, rise together amicably, without destroying each other. Besides, in doing this, many worthless plants are thrown aside, and those which are weak may be reserved for suitable situations; while the strongest are
planted

planted where the greatest strength is required.

But the *boldest* idea I have met with in hedge-planting is that of BURYING THE PLANTS! by covering up their heads, an inch or more deep, with mould: and this, not as an experiment, but in the practice of a common labourer.

The method of planting, in this case, is the common one of setting the plants behind the "cape-sod," or first-turned spit. But instead of leaving the heads two or three inches above ground, the plants are shortened, and the heads placed about an inch below the surface.

Observing a work of this kind presently after it was executed, I waited with impatience to see the event. In due season the plants made their appearance; not in a number of irregular spreading shoots, as from an exposed head; but rising, as from *seed*, in one, or perhaps two or three, straight upright shoots, of peculiar strength and beauty.

They did not, however, rise together; some of them remaining in the ground several weeks after the earliest made their appearance.

ance. The covering of mould, therefore, ought, perhaps, to be as fine, and laid on as light as may be, to prevent obstructions to the tender shoots in rising *.

The advantage of burying quick appears to be the valuable one of giving the young hedge an upright tendency, and thereby preventing the strength of the roots from being expended on useless side-shoots. Plants thus raised take the growth, and probably the habit of SEEDLING plants. The roots, in this case, may be considered as ARTIFICIAL SEEDS, furnished with a peculiar strength of vegetation.

3. DEFENDING. Posts and rails are the common dead fence. Sometimes one, sometimes two rows : a most expensive way of defending a young hedge.

In

* On close examination, I find the tallest strongest shoots rise from such as were barely, or perhaps impartially, covered with mould : such as were buried deeper are, *at present*, (in the month of August, the first year of planting) shorter and weaker ; owing, perhaps, to their rising later in the spring. It is therefore probable that the lighter and thinner the covering, provided it be sufficient to prevent side shoots, the more eligible is this practice.

In the lower parts of the Vale, where stones are not too numerous, and where deep ditches are requisite, the Norfolk method might be introduced with great propriety*.

But, in stoney soils, that method is impracticable: and there, two rows of posts and rails, or some other dead fence adequate to them, are, in most cases, absolutely necessary to good management.

It is therefore wise in the framers of Inclosure Bills to secure the right of placing fences during a certain number of years, upon neighbouring allotments, as guards to the young hedges †.

I have observed, in more instances than one, the good effects of setting a sharp *ridglet of earth* on the *outer brink* of the ditch, as a guard to the face of young hedge plants; especially against horses. In one instance, a young hedge was defended by two small ditches, one on either side, with banklets of this kind, without any dead fence whatever; and this, too, against well-bred hunters, such as would in a chace have taken the

* See NORF. ECON. Vol. I. p. 102.

† See ART. INCLOSURES.

hedgling and both ditches without hesitation. Cattle are less terrified with these devices.

The practice of pricking thorns into the first-turned sod upon the *inner brink* of the ditch, as a guard to the face of the quick against sheep, affords a degree of temporary security; but deprives the plants of that air and exercise which is necessary to a luxuriance of growth.

4. TRAINING. This department of the management of hedges is too much neglected in all countries. The planting, and the first erection of guard-fences, generally receive a tolerable share of attention. But repairing these fences from time to time,—destroying weeds,—and giving the young plants a proper tendency, are matters which are seldom considered as essential to success.

In this District the *front fence* is in general too little attended to, or neglected too long; the young plants being frequently brouzed and stunted before the necessary guard be thought of or placed.

With respect to *weeding*, however, the District is above par. But in regard to *training the plants* themselves, by striking off the
luxuriant

luxuriant side shoots, and thereby promoting the upward growth of the hedgling, it is very deficient.

I have, nevertheless, had frequent opportunities of observing one instance in which this requisite business in the raising of hedges has been executed in, perhaps, a singular manner. In this instance each plant is trained with a *single stem, pruned* in the nursery manner.

One advantage of this method is that of rearing *every* plant with a degree of certainty; the tops being in this operation attended to as well as the stems: those of the stronger plants being lessened, to give head-room to the weaker.

Another very great advantage, especially on a sheep-farm, is that of getting the young plants out of harm's way. Sheep are dangerous enemies to young hedges; and every expedient to guard against their mischievousness in this respect deserves at least a trial. Strong plants, judiciously planted, and trained in this manner, may, with a degree of certainty, be got out of the reach of sheep in three or four years.

The labour is considerable, but by no means excessive. In this one instance, the expence of labour appears to be greatly exceeded by the advantages obtained by it.

The pruning should be done in winter or spring, while the sap is down; not in the summer season.

5. AFTERMANAGEMENT. In this department, the District under survey excels: not in the manner of cutting, but in the frequency of it. Many young hedges are cut before they are twenty years old; and the cutting of such as are thriving at least, is usually repeated every five or six years; a practice which ought to be universally followed. Nothing is more injurious to a hedge than unfrequent cutting.

The prevailing *method of cutting* is that of "buck-heading;"—namely, cutting the stems off level, about three feet high above the level of the inclosure; generally winding a few straight boughs horizontally between the heads of the stems, to prevent stock from forcing through between them. A more simple, or a cheaper method than this, cannot perhaps be devised; especially as the
ditch

ditch is seldom touched; the roots being purposely suffered to strike across it; by which means they enjoy free pasturage on either side.

On the Malton side of the District, the prevailing method of cutting is that of *plashing* in the Midland manner: an operation which I shall have occasion to speak fully of in another place.

6. OLD HEDGES. The practice of *replanting* worn-out hedges in the Norfolk manner, I have not met with in this District.

Stopping *breaches* with *dead hedging*, thereby effectually preventing their ever closing again, is a piece of execrable management, which is no where more prevalent than in the Vale under observation.

One instance of exertion, however, in order to RECLAIM a live fence from a row of large old thorns, the remains of a neglected hedge, occurs in this District, and would do credit to any country. It is the only one of the kind I have met with.

The bushes or separate detachments of the old hedge being trimmed on both sides; and the main stems cut out at the ground, or

headed at such heights as circumstances required; the long slender boughs, growing in the line of the fence, were trained into the vacancies, with strong stakes, in the **ESPALIER MANNER**: a bank of earth having been previously thrown up, and the lowest ground-boughs **LAYERED** in it, in order to strike root, and send up fresh plants, to assist in filling up the vacancies effectually.

This mode of treatment is not applicable to such hedges only; but to every live hedge in which wide **VACANCIES** are found. The best time for filling them up in this manner is when the hedge is felled to the ground.

Another instance of practice in the management of old hedges, which had been planted on broad banks, with *ditches on either side*; and which, through the narrowness of the pasture, and the neglect of timely cutting, were become stunted, and thin of stems, merits notice.

The thorns, in this case, were felled to the ground; the ditch, to the southward or westward of the hedge, re-made; and that on the
north

north or east side of it *filled up* with the excavated mould. By these means the plants were supplied immediately with fresh pasturage in made-earth; and let loose to feed at large in the adjoining inclosure. The effect is striking. The plants shoot unusually strong; and, in three or four years, form an invulnerable fence.

Perhaps, REVERSING THE DITCH of an old hedge (with a *single* ditch) might INVIGORATE it in a similar manner, by giving the plants a fresh field of pasturage. The experiment, however, ought to be tried with caution. Depriving old plants of *all* their main roots (though they were at the same time cut off by the ground) might be dangerous.

GENERAL OBSERVATIONS. From what has been said on the ordinary treatment of hedges in this neighbourhood, it is evident that their superiority is not owing to an excellency of management. The richness of the soil; the neglect of the ditches; the frequency of cutting; and, above all, the present AGE of the hedges, account sufficiently for their PRESENT FLOURISHING STATE.

Those which strike the eye with a peculiar luxuriantcy of growth, are about FIFTY YEARS OLD: and it is abundantly evident, that hedges growing in a good soil may, until they have reached *that age*, be *headed fence-ly* with a degree of safety. But, on a nearer view, it appears to me equally evident, that the practice cannot be exercised, *in perpetuity*, with any degree of propriety.

On examining hedges, which have not been planted SEVENTY YEARS, and which have been treated invariably in that manner, I find they have already received irreparable injury. The underling plants are already so far destroyed as to leave vacancies of three feet or more in width; while the master plants, now no longer of themselves a fence against sheep, have acquired stems of a tree-like size.

FELLING TO THE GROUND, and training a range of *new stems*, is the only effectual remedy of this evil. But this when deferred too long is impracticable, or at least dangerous. Large old stems will not always survive the operation; but if applied in time, and with due care, the remedy is certain without risk.

It

It would be difficult perhaps to prescribe rules for the FELLING of hedges, by their *ages*; or the intervals of time between the fellings. *Perhaps* no hedge ought to stand more than FIFTY YEARS from the first raising, nor more than THIRTY YEARS between the *fellings*.

But, by their SIZES, and the state of their growth, some general rules may with propriety be mentioned. No *stem* (howsoever healthful, nor how sizeable soever to the neighbouring stems) of more than a *foot in circumference* ought to be suffered to remain standing.

If there be a great *disparity*, as there generally is, in the *size of the stems*, either the entire hedge ought to be felled before any of them acquire the limited size; or, in heading them, the larger ought to be *shortened proportionably to their respective sizes*, in order to lessen their destructive tendency, and to give the weaker an opportunity of gaining at least a temporary ascendancy*.

* An expedient of this kind I have seen executed with a tolerable appearance of success.

If the plants, let their age and size be what they may, grow *mossy*, or wear the general appearance of *stuntedness*, they ought to be removed, that a more healthy race may be trained up in their stead.

The same as to HEADING. No particular age can be pointed out for the first cutting; nor can any certain interval of time between the headings be prescribed with strict propriety. Soils and situations influence the growth of trees; and, viewing the management of hedges in a general light, the tops ought to acquire a degree of USEFULNESS before they be taken off.

A bough six or eight inches in circumference is large enough for a stake; and when the strongest have got to this size, the remainder are generally fit for the fillings of dead hedges: that therefore is the state in which they ought to be cut.

It would, in my opinion, be better management *in a man who occupies his own estate* to burn them and give their ashes to the winds, than to suffer them to remain on the stems after they have reached that size.

But

But *in a tenant*, who has no permanent interest in the hedges he occupies, neglect is less criminal.—It matters not to him whether the live hedges upon his farm remain sufficient fences *one* or *two* centuries. He is no way concerned in the purchase-value of the estate, unless it be in the depreciation of it. His plan of management (if he has any in this respect) is to make his hedges subservient to his own interest, especially when he has no certainty of continuing in possession.

These circumstances are not mentioned with a view of breeding ill-blood between landlords and tenants; but to endeavour to convince the former, that it is a duty they owe to themselves and their successors to pay some attention to the live hedges upon their estates.

It is now a custom pretty generally adopted upon wooded estates to appoint *woodwards* for the preservation of timber and underwood.—And upon every large estate, lying in an inclosed country, it is, in my opinion, equally necessary to appoint a HAYWARD for the preservation of its hedges.

An

AN EXPERIENCED HEDGER would perhaps be the fittest for this employment. In ordinary cases, as where heading only might be requisite, *orders* might be sufficient; but to the raising of new hedges, and the renewal of old ones, *personal attention* ought to be paid, not only to the planting and the felling, but to the fencing and the weeding, until the new or the renewed hedge be out of danger.

6. HEDGEROW TIMBER. This is an interesting subject to the proprietors of inclosed estates: and no country affords a better field for observation than that under survey.

The old-inclosed parts of this neighbourhood, when seen at some distance, have the appearance of woodlands; the inclosures being mostly narrow and full of hedgerow timber.

The age, on a par, is about fifty years. In half a century more, the value of the timber of some parts of it, if suffered to stand, will probably be equal to the value of the land: a circumstance this of no small import to the *owner*. But the detriment to the *occupier* requires to be considered.

In this country, it seems to be a general idea, founded perhaps on experience, that
lofty

lofty hedgerows are *beneficial* to *grassland*; increasing its productiveness by their warmth, and giving shelter and shade to pasturing-stock. The roots, even of the *ash*, are considered as *inoffensive* to land in a state of *grass*; in which state the grounds thus loaded with hedges and timber-trees is almost universally kept.

Indeed, it would be impossible, in their present state, to occupy them as *arable land*. There are entire inclosures, every foot of the areas of which must necessarily be occupied by *ash-roots*; nevertheless they give an ample supply of hay and pasturage. One to two tons of hay an acre. And in many of them, three acres will afford sufficient pasturage for two cows of the largest size. The rent from thirty to forty shillings an acre. Strong evidences these that the *roots* of the *ash* are not very injurious to *grassland*.

It is evident, however, that the *oak*, when suffered to thrust its *low spreading head* into the inclosure, is injurious to the herbage beneath it; that the *leaves* of the *ash* are very detrimental to aftergrass; and that the *hedges* are annually receiving irreparable damage;

mage ;—no general plan of training up the trees with tall stems having, I believe, in any instance been adopted.

GENERAL OBSERVATIONS. From what is here mentioned we may conclude, that the advantages arising from the planting of timber-trees in the hedges of inclosed common-fields, of a soil, and lying in a situation adapted to *grafs*,—are far superior to any disadvantages accruing therefrom, even where they have been suffered to grow in a state of almost total neglect.

Land which has lain open, and which has been kept in a state of *aration* during a succession of ages, is equally productive of *grafs* and *trees*. And it is generally good management to let it lie to *grafs* for some length of time after inclosure.

In this neighbourhood, it is evident to common observation, that *trees* flourish with unusual vigour in the newly-inclosed lands of *arable* fields ; and that their injury to *grafs-land* is inconsiderable when compared with the value of the *timber* they produce. The *low spreading heads* of the *oak* and the *leaves* of the *ash* appear to be the chief inconveniencies of these two species of trees to *grafsland*.

But

But an alternacy of *corn* and *grafs* is generally eligible on lands which our ancestors have made choice of for common-fields ; and the *roots* of the *ash* are not only obstructions to the plow, but the general nature of the plants is in a singular degree inimical to *corn*.

It is therefore necessary to eradicate the *ash* from the hedgerows, before the land be again broken up for arable ; or to preclude this tedious operation, in the first instance, by planting oak in its stead.

The HEAD of the OAK may be raised to such a height as to be no way injurious to *grafs* ; nor to the *hedge*, while yet in a youthful state, even though it be suffered to run up to its natural height.

Whenever the inclosures are broken up for *corn*, the *hedges* ought in common good management to be headed, and kept in a dwarfish state ; in which case TALL-STEMMED OAKS would be a valuable source of TIMBER, without being in almost any degree injurious to the HEDGE or the CORN growing under them.

But the TRAINING OF YOUNG OAKS, and the GENERAL MANAGEMENT OF HEDGE-ROW
TIMBER,

TIMBER, cannot, with any degree of prudence, be left to a mere occupier. Viewing hedges as nurseries of timber, a HEDGEMAN becomes essentially necessary to every landed estate.

10.

SHORES and SURFACE-DRAINS.

THE DIVERSITY of country which the District under survey exhibits, requires a varied exertion of art with respect to SURFACE-WATER. Upon the hills, art is required to *retain* it upon the surface; in the lower parts of the Vale, art is equally wanted to *hasten* it to the river or general outlet.

It has been already mentioned, that much of the bottom of the Vale is, by natural situation, liable to be overflowed by the rivers in time of flood. Nevertheless every part of it,
I apprehend,

I apprehend, is so situated as to be capable of being laid sufficiently dry, by the rivers at dead water.

Therefore the only exertion of art in this case requisite is, to open sufficient SHORES between the rivers and the grounds to be laid dry; sinking sufficient *ditches* from the shores; and sufficient *drains* from the ditches.

Many efforts of this nature have been made with spirit and with success. The WEST MARSHES, in general, are a striking instance: for although they lie upon a dead flat, and but barely above the level of the waters of the Derwent, they are at present kept principally in an arable state, and chiefly in wide flat beds. Nevertheless, by keeping open furrows, deep ditches, and clean shores, the land in general is left as free from superfluous moisture, as if it were elevated a mile above the Derwent.

But the EAST MARSHES (and some other smaller portions of the Vale) still remain a disgrace to the country; lying chiefly in a state of *fenn*—provincially “Carr;”—overrun with sedges and other palustrian plants; which afford, during a few months in sum-

mer, a kind of ordinary pasturage to young flock. In the winter months they are generally buried under water, and in the summer months are subject to be overflowed.

The remedy in this case (and in other cases of a similar nature,—of which almost every District in the kingdom affords an instance) is, TO BANK OUT THE RIVER, which winds through the middle of it; and, in doing this, TO SINK A COMMON SHORE ON THE OUTER SIDE OF EACH EMBANKMENT.

If, at the lower end of these *shores*, the RIVER lies *sufficiently low* at the time of dead water to receive, freely, the drainage of the marsh, the work may be completed with an inconsiderable expenditure, compared with the magnitude of improvements of this nature. FLOOD GATES, placed at the outlets, to give vent to the surface waters collected within the site of improvement, and to prevent the waters of the river in time of flood from flowing back upon it—are the only additional requisite.

If the surface of the RIVER at dead water should be found to lie *too high* for the necessary

sary

fary depth of the *shore*, MARSH MILLS * placed in the lower parts of the site will, in any ordinary case, do away the deficiency of fall.

The expence of a MILL is in the first instance considerable; besides an annual expence of repairs, and attendance. But supposing the first cost to be one or even two hundred pounds, and the repairs and attendance to be ten or even twenty pounds a-year, the whole expence would be inconsiderable, when compared with the improvement of converting, perhaps, two or three thousand acres of *unproductive fenny grounds* into ARABLE, MEADOW, and PASTURE LANDS, of *five*, or perhaps *ten times its value*.

In the case immediately under notice, mills, if requisite, could only be effective on one side of the river. The RIVULETS on the north side of the Derwent are too copious to be discharged by a mill. But by embanking those rivulets, and by furnishing each compartment of the marsh with a mill, the desired improvement might on a certainty

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be

* See NORF. ECON. MIN. 118.

be made. On the south and east side of the Derwent, where perhaps the greatest improvement may be expected, less difficulty would arise: the embankment of one rivulet would perhaps be found the only addition requisite to the general embankment*.

It may be unnecessary to say, that the excavated mould of the SHORES ought to go towards raising the EMBANKMENTS; thus obtaining, in one operation, the two principal means of improvement: or that *main drains* ought to be led from the shore into the area of the site to be improved.

One thing, however, may not be so obvious: namely, the SITUATION OF THE EMBANKMENTS WITH RESPECT TO THE RIVER.

If the BANKS be set upon the *immediate brink*, as in general they are, they become liable to be injured by the smallest *deviation* of the RIVER; with which the SHORES in this case become too nearly connected. Besides, the

* Since writing this article a meeting of the proprietors of these marshes has been held, to consider of an application to Parliament for *straightening and enlarging the bed of the Derwent!* But the proposal was over-ruled.

the waters of floods being by this means confined (supposing an embankment on either side) to the bed of the river, the banks require to be raised to an unnecessary *height*.

But if the lines of embankment be run at a proper *distance from the river*, as ten, twenty, or thirty yards, the BANKS and the SHORES are placed out of danger from the RIVER; and a greater area being left for the water of floods to spread over, their rise will be proportionably less, and the requisite *height* of bank will of course be lessened in the same proportion.

Theory may conceive a *waste of land* by this means; but experience shews that such an apprehension is ill-grounded. The embankment is equally beneficial to the land it encloses, and to that it shuts out from the river. The enriched waters of floods, now confined by the banks, deposit on the inclosed slips the whole of those particles which hitherto they had scattered over an extent of country. By this means the swamps and hollows of the slips are presently filled up; and in time the entire surface is raised.

I have observed an instance of this kind, in which the ground on the river-side of the bank has been raised near a foot above the natural level of the ground on the other side of it.

By this elevation of surface the land is not only laid dry, but, if the waters be of a good quality, is at the same time enriched.

These slips, if of sufficient width, are singularly well adapted to the purpose of OZIER BEDS : and are eligible PASTURE GROUNDS. The banks are places of safety for stock to fly to in floods ; a species of refuge they had not when the whole lay open.

The EXPENCE of embankment, in ordinary cases, and under proper management, is far from excessive.

This Vale affords more than one instance of RIVER-EMBANKMENTS. *Brawby-moor*, containing about three hundred acres of low marshland soil, over-run in an open state with furze and rushes, together with some interspaces of sedgy grass, was liable to be overflowed by the river Seven, which runs on the *upper* side of it ; the Rye, which washes it on the other side, being its natural shore.

These

These three hundred acres are the entire property of the EARL OF SALISBURY; and in their open state were let out in one hundred gaits for young stock, at ten shillings each gait, producing his lordship in that state fifty pounds a year.

The embankment cost about sixty pounds; namely, about three quarters of a mile at one shilling per yard. But the ruins of an old bank lessened the expence in this case.

The bank when finished was about seven feet high; wide enough on the top for cattle to walk upon; sloped sufficiently to prevent its shooting or being trodden down by cattle; and faced with green sods, to guard against the floods.

This improvement is worth tracing. Besides the embankment, which, if the old bank had not assisted, might have cost one hundred pounds, a road through the middle of the site of improvement was requisite to be made;—the whole to be inclosed; and some erections to be made. Suppose the road, the inclosure, and the buildings to cost three hundred pounds, the whole expence

would amount to four hundred pounds, or fifteen to twenty pounds a-year.

The rent, in the first instance, was, I believe, fixed at eight shillings an acre. Three hundred acres at eight shillings produce one hundred and twenty pounds a-year; so that in the outset there appears to be a clear improvement of fifty pounds a-year. In twelve or fourteen years it may be worth twice that rent, the soil being deep, and of a quality which, though not rich, is suited by situation to both corn and grass. When the stipulated improvements are made by the first occupiers, the three hundred acres will be worth at least two hundred pounds a-year; namely,

FOUR TIMES ITS FORMER VALUE.

Another instance of river-embankment occurs in *this* township. The commissioners under the Act of Inclosure have wisely secured the lower grounds to be inclosed from the waters of floods which have hitherto occasionally overflowed them. The remedy in this case was easy: a partial embankment only was necessary; and the bank, in the parts where it was wanted, seldom required to be raised above two or three feet high.

Never-

Nevertheless, the advantage obtained at this easy expence is that of enabling the respective occupiers of the lands under inclosure, to change them from a state of unproductive sward to that of arable land; and by that means to improve them, *perhaps*, to three times their present value.

If, in the MANAGEMENT OF ESTATES, any superior faculty be requisite, it is that of being able to strike-out and execute INTRINSIC IMPROVEMENTS; such as give a *permanent* increase of RENT-ROLL,—without diminishing the PERSONAL HAPPINESS OF the RESPECTABILITY of its OWNER.

WOOD.

II.

W O O D L A N D S AND P L A N T A T I O N S.

I. THE NATURAL WOODS of this District are numerous.

The vallies which sever the limestone heights, on the north-side of the Vale of Pickering, and give passage to the rivers and brooks which take their rise in the morelands, it has been said, are mostly filled with wood. Formerly, it is probable considerable plots of woodland were likewise scattered at the feet of those heights; but if there were, most of them are now done away: some few patches, however, remain.

On the southern banks of the Vale too are scattered some valuable tracts of woodland.

The TIMBER of these woods is chiefly OAK, with a small proportion of ASP. BLECH, even upon the limestone heights, a situation

to which it is peculiarly adapted, seldom if ever occurs in *natural* woods : a degree of evidence this that the OAK and the ASH are *natives*, lineally descended from the ancient forests which probably heretofore occupied these hills ; and that the BEECH is *not* a *native* of this part of the kingdom. The limestone heights of Gloucestershire, Herefordshire, and South Wales, are hung on every side with BEECH, growing, to all appearances, in a state of nature.

The information which I have gained respecting the woodlands of the District under survey, falls under the following heads :

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|-------------|--------------|
| 1. Raising. | 4. Timber. |
| 2. Selling. | 5. Bark. |
| 3. Felling, | 6. Carriage. |

1. RAISING. The practice of raising woods from ACORNS, a practice which formerly has evidently prevailed in different parts of the island, cannot easily be traced in this. In some few instances, however, *art* may have been employed ; but the generality of the old well-timbered woods which were standing within the present century, but which now
are

are nearly extinguished, have, it is highly probable, got up *fortuitously* from seedling-plants, rising in *neglected roughets*: a species of propagation which is still observable in almost every woody waste; and is in truth NATURE'S ONLY METHOD of propagating TIMBER OAKS.

AN OAK which springs from seed in an *open plain*, throws out horizontal branches on every side, and being browsed upon by cattle takes a *shrub-like* form. But oaklings rising in a *thicket* are secure from the bite of cattle, and are taught by self-preservation to shoot upward with a *single stem*; the sooner to gain the ascendancy of the shrubs which surround them.

This early *habit* of shooting upward, perhaps, afterward promotes an upward tendency. It is also probable that plants whose *constitutions* are naturally weak, are unable to cope with the difficulties which surround them; consequently that those which struggle through hardships so evidently great are of an aspiring robust nature. Be this as it may, it is observable that oaklings which rise naturally in thickets generally make tall vigorous trees.

But

But most of the woods which *at present* remain on *this* side of the Vale have been raised from STOOLS of timber-trees formerly taken down.

This method of raising woods is called “springing” them; or, with greater propriety, RE-SPRINGING them: a practice which has long been prevalent in this country, where COPPICE-WOOD is of less value than it is in most others,—*fuel, bedding-materials,* and a few *firkin-boops* being the only saleable articles.

When a wood is intended to be RESPRUNG, the timber is felled a few inches above ground, leaving the bark of the stools as entire as possible.

Before the young shoots make their appearance, the GROUND is or ought to be finally cleared from the fallen timber and topwood, and the FENCES made up. If the timber or topwood be suffered to remain among the stools until after they have made their first shoot, much mischief will be done in getting them off afterward. And if the young saplings be subjected to the bite of stock, especially in their infant state, the loss will not readily be retrieved.

For-

Formerly, defending the timberlings from foreign enemies was the only care bestowed upon “young springs;” and this perhaps not very rigidly attended to. Now, the fences are pretty strictly kept up, and the plants themselves from time to time *weeded*,—provincially, “looked ;”—that is, THINNED; the underwood and cross-growing timberlings being in this operation removed, to give air and room to those which are more promising.

The business of WEEDING is generally deferred until the weedling plants have acquired a degree of USEFULNESS; by which means the operation becomes doubly profitable.

The *first thinning*, I believe, is generally given as soon as the undergrowth is large enough for STAKES, and the *second* when it is long enough for RAILS; the former being given at about *ten*, the latter at about *twenty* years old. At every *ten* years afterward, for half a century at least, posts as well as rails may generally be taken with double advantage.

TIMBERLINGS trained in this way will reach, in a tolerable soil and a mild situation,
thirty

thirty to forty feet in height, and will measure from twenty to thirty inches in circumference, in about forty years.

It is observable, that when a wood is intended to be sprung again for timber, the entire ground is, or ought to be, cleared of every tree great and small. Single trees,—STANDARDS,—provincially, “wavers,”—left in a wood, under an idea of their being too young and thriving to be taken down, seldom retain a luxuriance of growth after the neighbouring trees are removed; but, by their drip and shade, do certain injury to the young saplings rising round them.

It is also observable, that there is a great inequality of success in raising timber in this way: while in some instances there will be a tenfold sufficiency of shoots to be trained; in others too great vacancies will be found. This is probably owing to MANAGEMENT, or to the AGE of the timbers taken down. A *young wood* may be sprung afresh with a degree of certainty. But, *perhaps*, there is danger as well as difficulty in regenerating an *old* one.

2. SELLING. It has already been intimated, that the large seedling-timbers which formerly

merly reared their heads in this District are now nearly extirpated. There is, I believe; but one estate, and that not of considerable magnitude, upon which any *large* timber can now be found.

THE AGE OF SELLING is therefore lower here than in most other countries. There are instances of sapling woods being sold at *forty or fifty years old*; and, when situated near a new Inclosure, are thought to pay better at that age than they would have done had they been suffered to stand a longer time.

One sold at *forty years old* neated to the feller about twenty pounds an acre. The soil a cold springy clay;—worth, in a state of ordinary improvement as arable land, seven or eight shillings an acre. But it would cost a considerable portion of its value to change it from a state of woodland to that state. Therefore, considering the cost of improvement in one case, and the profit of the weeding plants and underwood in the other, it is much more eligible to keep it in its present state, or to improve it to the utmost as woodland (there being in this instance several vacant patches), than to subject it to *agricultural* management.

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The MODE OF DISPOSAL is to sell it in the gross, *standing*; by *auktion*, or by *private contract*. The former, however, is for the seller the most eligible mode of sale.

The buyers of timber are generally men of business; professionally versed in the value of wood; and able to make their own valuation with sufficient accuracy, while the seller is obliged to rely on the abilities and the integrity of a third person; who, being uninterested in the sale, wants the grand stimulus to rigid accuracy.

But, in a SALE BY AUCTION, with a sufficient number of bidders, the seller's valuation is of little consequence: the bargain, in this case, is transferred to the bidders: the *contest* is not between seller and buyer, but between bidder and bidder; both (or all) of which being judges of the lot under sale, the seller has *more* than a fair chance of selling it for its full value.

The METHOD OF VALUING grown timber is to estimate every tree: not, however, by an exact admeasurement of each: but by taking the dimensions of a few with sufficient accuracy. The valuer, having by this means

adjusted the eye, he depends afterward upon that alone ; except now-and-then checking it with the rod and line. If the trees be of moderate girt, the rod and line are sometimes dispensed with, by men in great practice ; who, with the arms only, can take the girt and the ground-length with sufficient accuracy.

3. FELLING. The practice of resprouting fallen woods being the established practice of the country, that of felling timber trees *a few inches above ground* is universally prevalent. Grubbing, or grub-felling in the Norfolk manner, is seldom, if ever, practised.

The PEELING of oak timber is generally done by the day ; the labourers being, I believe, invariably employed by the timber-merchant, not by the tanner : practices which are productive of a considerable saving of bark. Men working by the ton or the quarter, or tanners paying by weight or measure, will not peel the boughs sufficiently near ; it is against their interest to do it. But it is the interest of the timber-merchant, or of the tanner, if he purchase by the gross, or by the ton of timber, to peel so long as the bark will pay

pay for the labour. This accounts for the smallness of the twigs which are peeled in this country: if the bark run freely, twigs not much thicker than the finger are frequently stripped.

The method of DRYING BARK in this country is generally the common one of setting it in a leaning posture against poles lying horizontally, on forked stakes. But in a wet season, or when the ground is naturally moist, it is laid across a line of topwood, formed into a kind of banklet, raising the bark about a foot from the ground. By this practice no part of the bark is suffered to touch the ground: and it is, perhaps, upon the whole, the best practice, in all seasons and situations.

4. TIMBER. For OAK timber, the principal *markets* have hitherto been the ports of Whitby and Scarborough. But there is now very little ship timber left. The seedling woods are few and small; and saplings in general standing thick upon the ground, perhaps three or four from a stool, rise too straight, and are yet much too young, for the purposes of ship-building. It is a fact, however, that at present (1787) the spirit of ship-building

is so flat, that scarce as ship timber is really become, the market is now overstocked.

The medium PRICE of *ship-timber*, delivered at the ports, is 3 l. to three guineas a ton of forty feet. But the price varies with the times, and still more according to the quality, that is the *crookedness* of the wood. Oak timber, fit for the purpose of the *house-carpenter*, may now be bought for fourteen pence a foot.

ASH timber is chiefly worked up by the *cartwrights*; and by *coopers* into butter-firkins and dairy utensils. The *price* one shilling to eighteenpence a foot in the stick.

This similarity of price between ash and oak is owing to several causes: the present want of demand for oak; the present scarcity of ash; and to the circumstance of ash timber being, on the spot, at its principal market; whereas oak requires to be carried twenty miles before it can be placed in a similar situation.

5. BARK. Oak bark is here sold to the tanner ready-prepared for his use. The timber-merchant not only dries it in the wood,

but

but stacks or houses it; and generally shaves and *chops* it ready for the tan-pit; selling it to the tanner at so much a quarter.

This custom appears to be founded on a false basis: the tanner is, or ought to be, the best judge of the mode of preparation, and the operation ought to pass under his eye.

The practice of *grinding* bark does not seem to have yet got footing in the District: whenever it does, it will of course bring the preparation of bark into its proper channel.

The medium *price* of chopt bark, 10 s. 6 d. a quarter.

6. CARRIAGE. The carriage of timber has long been a distinct employment in *this* part of the District. The price for twenty miles, the nearest distance, is about 15 s. a ton of forty feet; for forty miles, the longest distance, 30 s. has been given:—this is, in both cases, *ninepence a ton a mile*.

Supposing the price of oak timber at the ports to be three pounds a ton; and that it lies at the western extremity of the Vale; the carriage reduces the price, in the place of growth, to 30 s. a ton; which is *one-half* of the price at market. But timber which

grows only twenty miles from the ports is reduced in price by carriage only *one-fourth* of its market-price; and that grown within ten miles of market, no more than *one-eighth**.

These circumstances show, in a striking manner, the advantage of propagating timber in the neighbourhood of ship-yards; and point out the impropriety of raising it at a distance from water-carriage; or some established inland-market.

II. PLANTATIONS. The spirit of planting can scarcely be said to have gained a footing in the District under survey.

Of late years the passion of taking down has been much stronger than that of raising up. Indeed, in some parts of it, the NATURAL WOODLANDS which abound render PLANTATIONS less necessary.

But

* Some years ago the price of ordinary ash timber, at Scarborough, was 11 d. a foot. I knew an instance of a parcel being carried somewhat more than twenty miles (the inland-market being of course over-stocked) at the rate of 5 d. a foot for carriage. This reduced the price to 6 d. a foot in the place of its growth. Had such ash timber been carried at those prices from the extremity of the Vale, it would have neated only 2 d. a foot.

But upon the *wolds* and other *heights* adjacent to the Vale, SHELTER-PLANTATIONS are every where wanted; and it must be a matter of astonishment to every one who gives it a moment's reflection, that the spirit of planting should in these situations have lain dormant so long.

Upon the WOLDS, however, it has at length roused into action. SIR GEO. STRICKLAND has scattered a number of sheltering clumps upon the heights towards Malton; and SIR CHRISTOPHER SYKES and others are placing skreen plantations upon the bleak swells of the higher wolds. Should this laudable spirit diffuse itself into a general practice, not only the face of this fine passage of country, but the very soil, or at least its produce and value, will in a short time be changed.

The skreen plantations which I have observed upon the wolds are all of the MISCELLANEOUS kind;—pines and deciduous trees of various sorts mixt together.

It strikes me, however, that the BEECH alone would be the most eligible tree to be propagated upon the wolds: it is peculiarly adapted to calcareous soils; and thrives

with singular vigour in exposed situations. Upon the chalky hills of Surrey and Kent it is the prevailing timber tree. Upon the hills about Amersham in Buckinghamshire, too, a chalky soil, the beech thrives with uncommon beauty and luxuriance: and its wood seems to be growing daily into estimation.

Sowing the masts in drills, and cultivating the intervals, is perhaps the most eligible method of propagating this tree for the purpose here mentioned.

In the VALE, the almost only plantations which have been made with a view to utility, are small clumps of *Scotch fir*, planted for the purpose of giving shelter and shade to pasturing-stock.

There is one instance, however, in which a more regular plan of improvement has been chalked out and executed.

This instance of improvement having been prosecuted with judgment and perseverance, and by one from whom I have received more useful ideas in planting than from any other man I have conversed with, is noticeable.

The *site* of improvement was a low moory swamp,

swamp, lying barely above the level of a rivulet running by the side of it. The *sub-soil* a blue clay: the *top-soil* a black peat earth, of an irregular depth; varying from a foot to three or four feet deep. The *turf*, a mat of rushes, sedges, and other palustrian weeds, equally unpalatable and unproductive, either of hay or pasturage; some parts of it being dangerous to stock. The *form* triangular: the *area*, containing nine or ten acres, an entire flat; except a gentle descent towards the longest corner. The *situation*, though low, extremely chilling, being exposed on every side in a naked watery plain.

The IMPROVEMENTS obviously requisite in this case, were *warmth*, and a proper degree of *dryness*.

To obtain these, the rivulet and the surrounding ditches were deepened; and a deep counter ditch, or main drain, sunk at a distance from the boundary fence; leaving an irregular border, of five to ten yards wide, entirely round the area of the site of improvement, which by this simple operation alone was removed sufficiently out of the water's way; except at the lowest extremity, where
the

the main drain had its outlet into the rivulet.

The BORDER, too, by the same operation, was laid sufficiently dry for the purpose of PLANTING.

The lowest extremity, and the moister part of the margin next the rivulet, were planted with AQUATICS; the drier parts with FOREST TREES of various species.

It is now fourteen or fifteen years since this improvement was first set about. The border of planting begins already to have, at some distance, the effect of an entire plantation of equal circuit; while the area within enjoys all the advantage which shelter can give it.

What remains to be said here respecting the effect of the improvement under detail, is to mention the present state of growth, and the comparative progress of the different SPECIES OF FOREST TREES UPON A DRAINED MOORY SOIL*.

It is an opinion of the improver of this plot of ground, that a DRAINED MOOR is the

* The further improvement of the *area* will be mentioned in its proper place.

driest of soils : an opinion founded on his own experience. The summers of Eighty-five and Eighty-six were very dry ; the plantation made little progress, and the area was unproductive. This year (1787) the summer has been moist ;—the trees and the grass are equally luxuriant.

MOORY SOIL, when perfectly dry, repels water like a dry sponge ; but, like this, when once it is saturated with moisture, it retains it longer than common earth does. But a moor, effectually drained, and placed above the level of collected moisture, is not readily filled with water ; it may therefore be justly ranked among the *driest* soils.

This accounts for the rapid progress which the BIRCH and the SCOTCH FIR (both of them mountain plants) have made in these plantations. In the drier parts they are more than twenty feet high ; far outstripping every other species ; except

The NORWAY SPRUCE, which, for the first ten or twelve years at least, thrives vigorously. But some plants of this species, planted fourteen or fifteen years ago, are getting ragged, and appear to be in an unthriving state.

state. But whether this be owing to the severity of the late winters, or whether the roots, being now cramped for room, have got down to the uncultivated moor, or the cold barren clay which lies under it, is uncertain.

The AMERICAN SPRUCE, too, the PINE-ASTER, the LARCH, and the VIRGINIA CEDAR, thrive abundantly in this soil and situation; but none of these have been planted more than seven or eight years.

The ASH and the BROAD-LEAVED ELM also make a promising appearance; but the OAKS, though they look healthy, do not shoot upward*.

On the moister parts the ALDER takes the lead. But the ASH, the ASP, the POPLAR, and the OSIER, grow with sufficient luxuriance, to shew that their situation is perfectly agreeable to them.

A

* This, however, is thought to be owing more to late spring frosts than to the nature of the soil. *Silver firs* have done worse than the oaks; but shoots several inches in length have been evidently observed to be nipped off by *summer* frosts; which, it is observed, are much stronger in low than in high situations; owing, perhaps, to the greater quantity of moisture in the air: This, at least, accounts for the extraordinary quantity of *bar* in low situations.

A patch of OZIERs were kept down, experimentally, as an OZIER BED. The growth was luxuriant; and the profit, the second to the fifth year, ample; the produce, at least, five pounds an acre yearly: but the plants beginning to decline, and an ozier ground not being calculated to give the required shelter, the experiment was not pursued. The *oziers* which were suffered to run up from the first planting, have already been cut for rails.

GEN. OBS. Upon the whole, it appears to me evident, that the OSIER, the ASH, and the BIRCH are the most eligible species to be planted on a DRAINED MOOR; keeping them in a state of COPPICE WOOD, and felling the inner and outer edges of the border alternately: the first fall for stakes; the second and succeeding falls for rails.

By this means a PERPETUAL SHELTER would be secured.

A few SCOTCH FIRS planted at proper distances upon the margins, and kept pruned on the inner sides, would add a degree of ORNAMENT, without being destructive of UTILITY.

12.

F A R M S.

THE SIZES OF FARMS vary in different parts of the District. On the WOLDS, they are principally *large*; in the VALE and the MORELANDS, *extremely small*:

Considering the VALE distinctly, more than half of its lands are laid out in farms under twenty pounds a-year. Perhaps three-fourths of the Vale and the lands belonging to it lie in farms of less than fifty pounds a-year.

In the west marshes, and in the RICHER PARTS OF THE VALE, low moist situations; inhabitants are thinner, and farms larger.

But viewing the Vale collectively, there is not perhaps in *this* kingdom another District of equal extent, and of which HUSBANDRY is the PRIMARY OBJECT, which contains so great a number of *farms*, or rather parcels of land in distinct occupation; many of them being occupied not by TENANTS but by OWNERS.

The

The advocates for SMALL FARMS will conceive that a District thus laid out must necessarily excel in husbandry; and that the superiority of management must of course be in proportion to their degree of smallness.

On the contrary, however, no country perhaps affords stronger evidence of the fallacy of those conceptions. A mixture of good and bad management is evident in every quarter of it; and it is on the LARGER, *not* on the *smaller* farms, we find a SPIRIT OF IMPROVEMENT, and a SUPERIORITY OF MANAGEMENT prevail.

Poverty and ignorance are the ordinary inhabitants of small farms: even the smaller estates of the yeomanry are notorious for bad management.

It is on the larger estates of yeomanry, and on the larger farms of tenants, we must look for the best practice of the District.

It is not meant that a regular gradation of management can be traced by the magnitude of farms: many exceptions might be pointed out. Nor does it follow from the evidence of this District that *very large farms* are conducive to good management. An occupier
of

of eight hundred or one thousand pounds a-year is too fully employed with the OUTLINES of management to attend sufficiently to MINUTIÆ, much less to conceive and execute useful IMPROVEMENTS. His best management is to press forward in the beaten track of the country he farms in ; depending upon the amplex of his business to make up the deficiencies arising from the unavoidable neglect of minutial matters.

THE CHARACTERISTIC OF FARMS in the Vale is GRASS, with a smaller proportion of arable land.

Formerly, the area of the Vale was principally grass, and the margins open arable fields. Now, the latter is inclosed, and principally applied to the use of the dairy ; while the former is much of it subjected to arable management.

Upon the whole, although the admixture of ARABLE be considerable, the Vale in a general point of view comes under the denomination of A GRASSLAND COUNTRY.

13.

FARMERS.

FROM WHAT has been said in the last section on FARMS, a general idea of the FARMERS of the Vale may be gathered.

Among the lower class of *tenants* little information can be expected, and still less from the *inferior yeomanry*, whose scanty possessions are too frequently marked with an inferiority of management.

It is from the superior class of yeomanry, and from some few principal tenants, we must expect to learn the best practice of the country. It is on the farms of men whose independency, conversation, and perhaps reading, has led them to think and act without prejudice, we must expect to find a superiority of general management, and a spirit of improvement prevail.

It has long been observed in the economy of nations, that where liberty is established

there commerce and the arts flourish. And it is equally observable in Rural Economy, that where independency resides, there agriculture improves. A man cultivating his own estate enjoys the highest degree of independency; a lease-tenant the next; tenants at will the lowest.

It has already been intimated, that in this District tenants at will (some very few perhaps excepted) have lost all *confidence*, and consequently have lost even their *ideal independency*. They *dare* not *improve* lest unfair advantage should be taken of their improvements. It has also been said that leases are yet but little in use.

Therefore, among the YEOMANRY alone we must look for that degree of independency which is essentially necessary to improvements in agriculture.

No country of equal extent can boast of so numerous a body of yeomanry as the Vale under survey; nor any country, I will venture to affirm, where industry and economy are more conspicuous; or where a personal independency is so strongly rooted among men in middle life.

14.

WORKMEN.

THE YEARLY SERVANTS of this District are noticeable for the highness of their wages, and the lowness of their living, and for the length of their working hours.

The WAGES of an able man-servant, twelve to fifteen pounds a-year. During the late war, fifteen to eighteen pounds were given!

But the simplicity of their DIET more than compensates for the extraordinary height of their wages. Milk still remains here a food of farmers servants. In some places, animal food three times a day is expected; here, once a day (except perhaps in haytime and harvest) is considered as sufficient.

In MALT-LIQUOR too, the farm-servants of this country are equally moderate.

Nevertheless, if one may judge from their appearance, and from the quantity of labour they dispatch, their mode of living is conducive to HEALTH.

The TIME OF CHANGING SERVANTS which prevails through this country is *Martinmas** (Nov. 22.). The conveniency of this time of changing servants, and the inconveniency of changing at Michaelmas, have been pointed out on a former occasion †.

15.

BEASTS of LABOUR.

THE LONG-AGITATED dispute about the superiority of OXEN or HORSES as beasts of draught, may here be considered with singular propriety. But I am afraid even this country will not furnish sufficient evidence for a final decision.

Formerly, and from time immemorial, four or six oxen in yokes led by two horses, also double, were the invariable “draught”

* Excepting CLEVELAND, where *Mayday* is a more general time of changing.

† See MINUTES OF AGRICULTURE—Dates 10 and 12 OCTOBER 1775.

or team of the country ; not only upon the road, but in plowing. Even in stirring a fallow, four oxen and two horses were generally considered as requisite. And in breaking up a fallow, two men and a boy were the common attendants of this unwieldy expensive team.

At present, there is not perhaps throughout the Vale a single ox employed in tillage : two horses with whip-reins without a driver is now the universal plow-team for all soils, in almost every state.

Upon the road, however—that is to say, in farm-carriages—oxen are still in use ; but seldom more than a single pair to a carriage ;—generally at the pole, with two or three horses at length before them. Besides, a number of entire horse-teams now travel upon the roads ; things which formerly were unknown in the country.

On a general view, and in the opinion of men whose age entitles them to be judges of the subject, there is not kept at present one-fourth of the working oxen which formerly were employed in the Vale.

Shall we hence argue, that because oxen have declined, they are ineligible as beasts of draught? It might be unfair to do it.

There are two evident causes of the decline of oxen in this country.

Formerly, there was not only much more land in tillage, but the plow of those days was a heavy ill-shaped implement, requiring at least one pair of oxen extraordinary to draw it; yet, unwieldy as it was, the quantity of land then in tillage required that it should be worked in all seasons. At present, the plow in use is admirably constructed;—light and well formed for passing through the soil. With this plow, and with the land in season, it is found that the two horses alone without the oxen are sufficient for the purpose of tillage. This, in a country where the breeding of horses had long been an established practice, was a sufficient cause of *the disuse of oxen in plowing*.

Their *decline upon the road* is in part owing to the same cause. Four horses make two plow teams, and occasionally a road team. This accounts, in some measure, for the increase of horse-teams upon the road; but it is

not

not the only cause of their increase. When oxen were in common use, the *roads* lay in their natural flat state; deep in winter, and soft to the hoof in summer: now they are universally a rough causeway of lime-stones, in all seasons unfriendly to the feet of oxen. Even shoeing is found ineffectual when they go constantly upon the road.

Under this change of circumstances it is no wonder that the use of oxen should have declined. On the contrary, it appears to me a matter of surprise that so great a number should still be employed; a circumstance which, in my mind, evinces their utility as beasts of draught.

Even the timber-carriers (an industrious, wary set of men) continue to use them; tho' their sole employment be upon the road. They not only find them able to stand working every day, provided their feet do not fail them; but what is much in their favour, they are found to stand long hours *better* than horses going in the same pasture. An ox in a good pasture soon fills his belly, and lays himself down to rest; whereas a short

summer's night scarcely affords a horse time enough to satisfy his hunger.

Another advantage of oxen is here held out. In stiff pulls of every kind, most especially in going up steep hills, a pair of oxen are considered as a sheet-anchor. Horses, it is argued, are fearful, and soon lose their feet in a steep slippery road; while oxen, where they are unable to proceed, will always stand their ground. Indeed oxen seem to be considered as essentially necessary in an awkward hilly country.

This idea, in a country where half-bred hunters are the principal horses used in draught, is no doubt well founded; but where thorough-bred cart-horses are in use, it loses much of its weight.

But what are thorough-bred cart-horses? Why, a species of strong heavy sluggish animals, adapted solely to the purpose of draught; and, according to the present law of the country, cannot, without an annual expence, which no one bestows upon them, be used for any other purpose.

This species of beasts of draught cost, at four years old, from twenty to thirty pounds; will,

will, with extravagant keep, extraordinary care and attendance, and much good luck, continue to labour eight or ten years; and may then generally be sold for five shillings a head.

If we had no other species of animals adapted to the purpose of draught in the island, nor any one which could be naturalized to the climate, cart-horses would be truly valuable; they being much superior to the breed of saddle-horses for the purpose of draught.

But it appears to me evident, from the experience I have had, and the observations I have made, that were only a small share of the attention paid to the BREEDING of draught-oxen, which now is bestowed on the breeding of cart-horses; animals equally powerful; more active; less costly; equally adapted to the purposes of HUSBANDRY, (if harnessed with equal judgment); less expensive in keep and attendance; much more durable; and infinitely more valuable after they have finished their labours—might be produced*.

* I do not mean to intimate that any breed of oxen would be equally fit as horses for the *road only*: I have had
had

OXEN, here, are all worked in *yokes*, and always *led* by one or more horses. They are usually broke in at two or three years old; and worked until they be rising six; when they are bought up for the Midland or South-country graziers.

Considering oxen as *rearing cattle* which are worked occasionally during the years of growth, this plan of management is eligible enough; but viewing them abstractedly as *beasts of draught*, that mode of treatment is very injudicious: they are worked while they are feeble for want of age, awkward for want of experience, and thick-winded through a fullness of growth; and thrown up so soon as they have learnt to know their duty, and are become able to stand work.

A steer,

had no experience of either of them in this kind of employment; which is foreign to the present subject; let carriers and draymen make their own election. All I contend for is, that, were a proper attention paid to BREED, oxen, and spayed heifers, equally as fit for the purposes of tillage, the carriage of manure, hay, corn and fuel, and for every other purpose of DRAUGHT in the ordinary business of HUSBANDRY, as the heavy cart-horses at present in use, might be obtained.

A steer, like a colt, ought to be familiarized to harness at two or three years old; but should never be subjected to hard labour until he be five years old: from which age, until he be fifteen or perhaps twenty, he may be considered as in his prime as a beast of draught. An ox which I worked several years in Surrey, might, at seventeen or eighteen years old, have challenged, for strength, agility and sagacity, the best-bred cart-horse in the kingdom. .

The SPECIES of ox worked in this District will appear under the head BREED OF CATTLE.

IMPLE-

16.

I M P L E M E N T S.

The Implements of the Vale which require to be noticed are,

- | | |
|--------------------------|----------------------|
| 1. Waggon. | 4. Moulding sledges, |
| 2. Plows. | 5. Machine fans. |
| 3. The common
sledge. | |

1. WAGGONS. The waggons and other wheel-carriages of the Vale are, with respect to size, much below par.—A full-sized waggon does not measure more than forty cubical feet. The ox-cart—provincially “coop”—about twenty-four feet.

Their *construction*, though in many respects singular, is passed over, as being no way peculiarly excellent *. But they have a *defect* which

* Excepting in two petty improvements which I have not observed elsewhere. The one is a simple improvement

which requires particular notice; as it is not peculiar to the Yorkshire waggon; but is common, in a greater or less degree, to the carriages of every other District.

The Turnpike-road Act, made in the thirteenth year of the present reign, orders, “that no pair of such wheels, (common three inch wheels) passing on turnpike roads, being above twenty miles from London, shall be wider than *four feet six inches* from inside to inside, to be measured on the ground;” (that is, *four feet nine inches from middle to middle of the ruts*) “under the penalty of five pounds!”

The

improvement of the WHEEL-WASHER—provincially “Runner”—which frequently sticking in the end of the nave, wears off the ends of the linch-pin; thereby losing its principal intention. The improvement is made by placing a knob on the outer surface of the Washer; which, catching the end of the linch-pin, prevents its turning round with the wheel; by which means the entire friction is, as it ought to be, between the Washer and the end of the nave. Accidents frequently happen for want of this precaution. The other improvement is a FALLING-DOOR in the bottom of the fore part of the waggon; for the more easy delivery of lime, coals, and other body-loads.

The waggons of the Midland counties (the size of them extraordinary large) run the width of five feet two or three inches from middle to middle of the rut. Those of Gloucestershire (of the middle size) run four feet nine inches wide: those of the Vale of Pickering only four feet three inches.

All these widths are *much too small* for the respective sizes of the carriages: and how the framers of the Bill above-mentioned could impose a restriction evidently tending to destroy the roads they were endeavouring to preserve, is a matter of surprize.

In the article ROADS, page 184, the effects of carriages passing upon shelving roads (of the nature of which every *barrelled turnpike-road* more or less partakes) have been mentioned. The damage will always be in proportion to the inclination of the road, to the height of the load, and to the narrowness of the span of the wheels, considered jointly.

The center of gravity of the load, (including the carriage) and the two points of the peripheries of the wheels, (of a two-wheeled carriage) which are in contact with the road, form a triangle. The extremity of damage
is

is when the load is in the equipoise of overturning; the entire weight of the load and carriage resting at that time upon one wheel; which, in that case, injures the road just as much as a load of twice the weight would do passing upon a level road. Whenever either *side* of the triangle above-described is brought into a perpendicular position, the load is in the injurious equilibrium.

These premises being duly considered, it is obvious that there are three ways of reducing the perpendicularity of the line; consequently of preventing a loaded carriage from being placed in so destructive and dangerous a state. First, by raising the depressed corner of the triangle; that is, by bringing the road nearer to a level: second, by shortening the sides of the triangle; that is, by lowering the center of gravity of the load; or, in other words, reducing the height of the carriage: third, by lengthening the base of the triangle; that is, by widening the span, or placing the wheels farther asunder. These things are mathematically demonstrable; but as they must appear obvious to every one acquainted with the rudiments of science,

ence,

ence, it would be wrong to load the present volume with a more minute explanation.

But the injury of the roads is only one part of the mischief arising from the wheels of carriages running too narrow. The increase of draught (see *ROADS*, p. 181.); the extraordinary stress and wear of the carriage; and the evil effects of overturning;—are matters of still more importance to farmers, and other proprietors of carriages.

It would, perhaps, be in vain to conjecture the means through which the present widths of the span of carriages have been established in different countries; each of which has its particular width; otherwise the difficulty of passing in rutty by-roads would be greatly increased.

In the present state of husbandry and land-carriage, and the present state of roads, it appears to me evident, that *GATEWAYS* alone ought to prescribe bounds to the width of carriages.

Farm gateways measure from eight feet and a half to ten feet wide. I know no extraordinary inconveniency arising from a gateway of the latter width; and through such a
gateway

gateway there would be no difficulty in conducting a carriage with dished wheels running five feet or even six feet wide.

This increase of width would operate in a variety of ways to the advantage of land-carriage. Roads would be less injured; team-labour would be facilitated; carriages would last longer; and loads would be less exposed to danger than at present.

Nor would these be the only advantages: the increased distance between the wheels would admit of a proportional increase in the width of the body of the carriage; and this of a proportional reduction of the height of the load. Advantages these, besides the additional strength which the carriage would by this means receive, which appear to me too obvious to require further argument*.

VOL. I.

T

2. PLOW

* These principles are applicable to every species of carriage. The accidents which are daily occurring upon the roads form a subject worthy of humanity. If the ingenious promoter of the present improved mode of conveying post-letters would order his carriages to be so constructed as to move upon bases one foot wider than the narrow foundations on which they at present totter, we should hear of fewer bones being broken in mail-coaches.

II. PLOW. The plow at present in universal estimation in the Vale is of the little, short, winding-mouldboard sort, which in different parts of the kingdom goes under the name of the *Dutch-plow*, or the *Yorkshire Plow*.

On the construction of a ship volumes have been written, without any universally received principles being yet established. The Bermudians, who build by the *eye alone*, without either drawing or gauge to assist them, excel all other nations in the construction of small vessels (the almost only *produce* of their islands); which are remarkable as fast sailers, and notorious for lying nearer the wind than any other vessels.

Different as the ship and the plow may be in magnitude and general appearance, there is some similarity in the principles of their construction; and the difficulty of fixing those principles, and of reducing them to a regular theory, is nearly the same in both. The art of construction in either case is principally attained by practice.

In this District, the species of plow under notice is in general constructed better than

it

it is perhaps in any other; yet even here, the plows of different makers pass through the soil with various degrees of facility and execution: nevertheless, though I have paid some attention to the different makes, I find myself entirely incapable of laying down such particular rules of construction as would do my country any service, or my work any credit. Even the general principles of construction I must mention with diffidence.

The great difficulty, in the construction of a plow, is that of adapting it to all soils, in all seasons, and to all depths.

If the soil break up in whole furrow, every inch of *depth* requires, in strictness, a separate plow, or a separate regulation. Here rests the main objection to the WINDING MOULDBOARD, which admits of no regulation in respect of depth.

If the *semi-arch* or hollow of the hindpart of the mouldboard be raised sufficiently high to turn a thick furrow completely, it is of no use in turning a thin one. On the contrary, if it be brought down sufficiently low to turn a shallow furrow properly, it is im-

possible to turn a deep one with it in a workmanlike manner. There is not room for it within the hollow or semi-archway of the mouldboard. The inevitable effect of this is, either the furrow is forced away wholly by the upper edge of the mouldboard and set on edge; or the mouldboard rides upon the furrow, raising the heel of the plow from the ground; the evil effects of which need not be explained.

AN UPRIGHT STERN, with a moveable HEELPLATE† to turn the furrow at any given depth, is in this point of view much preferable to a hollow mouldboard; and if its use in raising a crest of mould for the purpose of covering the seed be added, its preference is still more conspicuous; and I see no reason why the Yorkshire plow should not receive so valuable an improvement.

The FOREPARTS of a Yorkshire plow of the best construction are admirably adapted to insinuate themselves beneath the soil and raise the furrow: a better form, perhaps, cannot be conceived.

But

† See MINUTES OF AGRICULTURE, Plate III.

But the plows even of this neighbourhood are far from being uniformly excellent in that respect. The NECK is frequently too thick and the BOSOM too hollow : the former creates an unnecessary friction ; and the latter forms a receptacle for loose mould to lodge in ; and both of them are detrimental to the turning of the furrow. The bosom may be made too full, but the neck cannot well be made too fine on the off or outer edge.

The right-hand side of the socket of the SHARE ought to be brought down to a sharp angle, or rather to an edge ; the under side being made flat, and as level as may be with the under surface or soal of the plow. The part which is folded back to lay hold of the bottom of the woodwork too frequently forms a foul protuberance on the soal, rendering the plow unsteady ;—increasing the friction unnecessarily ;—and, by raising up the fin of the share, prevents it from acting properly.

The form of the Yorkshire plow is not its only excellency : the ordinary PRICE of the woodwork complete, is not more than seven shillings and sixpence ! the iron-work about

twenty shillings, including plates for the landside and mouldboard. *Cast iron plates*, somewhat resembling those of the Norfolk plow, are now coming into use instead of wooden mouldboards. These will reduce the general *price* still lower.

III. THE COMMON SLEDGE. This petty implement will be considered as unworthy of notice by those who are unacquainted with the uses of it. Nevertheless, here, where it is in common use, it is in universal estimation.

For carrying harrows and other implements,—thorns and other rough wood,—turneps when the ground is tender, &c. &c. a sledge is frequently much preferable to a cart or a waggon. Some are made small and light for one horse; others strong and large, to be drawn by a team of oxen or horses.

The principal singularity of construction consists in a valuable addition to the common harrow-sledge of other countries. This addition is made with two cross-pieces (like the cross-pieces of a cart or waggon), one fixed upon each end of the body of the sledge, projecting without the side-pieces
about

about ten or twelve inches at each end. Upon the extremities of these cross-pieces are fixed two rails,—provincially, “shelvings,”—one on each side; thus increasing the width and hollowness of the bed of the sledge, and thereby rendering it capable of carrying a larger load with greater steadiness.

IV. MOULDING SLEDGE. This implement, I apprehend, is peculiar to Yorkshire.

Its USE is that of smoothing the surface of meadows; at the same time spreading the dung and molehills.

The CONSTRUCTION is that of the body of the common sledge, without its side-rails and cross-pieces; the upper edges of the side-pieces (of the body of the sledge) being for this purpose made perfectly straight.

In use, it is drawn with the face downward, and the side foremost, across the ridges.

Its *effect* is different from that of the LANDPLANE described in the MINUTES OF AGRICULTURE, which having a middle bar, *levels* the surface; whereas this, having no middle bar, only *smooths* it.

The FRONT BAR (namely, the *side* which is drawn foremost) forces off worm-casts, the

rudiments of anthills, and other protuberances of the surface ; also collects the dung of cattle and horses, the molehills, and other loose incumbrances which lie in its way.

This collection of materials being driven before the implement grind each other down fine enough to lodge in the dimples and fissures of the sward, thus smoothing the surface in a two-fold way ; at the same time mixing, reducing, and distributing the meliorating ingredients in the most effectual manner.

The FRONT BAR is sometimes shod with iron, projecting with a hoe-like edge before the woodwork. But this is unnecessary ; and is frequently injurious in defacing the sward. The woodwork itself, while the acting angle in front remains sharp, is perhaps the best : but the angle soon wears off ; by which means the implement loses its effect in removing the more stubborn protuberances. An iron bar fixed, *not beneath*, but in the *front* of the woodwork, the lower edge being set flush with the face of the implement, acts in a similar way to the wood itself, without being so liable on this to be worn away.

The

The use of the HIND BAR is to give firmness to the implement, and to finish what the front bar may by accident have left incomplete; the manner of acting being in both of them the same.

The length or width of this implement is usually six to eight feet. The breadth, or dimension from out-to-out of the front and hind pieces, four to five feet. The depth of these pieces six to eight inches; their thickness about three inches.

Additional weight, if required, is given by logs, stones, or other heavy materials laid upon the cross bars which bind the two acting pieces together. In places where a particular exertion is requisite, the driver will add his own weight by stepping on to the implement, and remaining upon it until the difficulties are passed.

V. WINNOWING MACHINE. This excellent machine is too well known as a *curiosity* in most parts of the kingdom, to require, in this place, a general description *. But the
county

* The late Mr. *Sharp* of London made it several years. *Winlow* of Margaret-street, Cavendish-square, still makes it.

county under observation being the only one in which its *use* has been established in COMMON PRACTICE, it merits in this place particular notice.

We are probably indebted to the Chinese, or other eastern nation, for the invention of this machine. I have seen it upon an India paper drawn with sufficient accuracy, to shew that the draughtsman was intimately acquainted with the uses of it. The Dutch, to whom the invention has been ascribed, imported it, in all probability, from the East Indies. Be this as it may, it indisputably came from Holland into this country.

Its first introduction into the Vale was by a gentleman of this neighbourhood, about five-and-thirty years ago. But the introducer committing this complex machine to the care of servants, without paying attention to it himself, it was, as might be expected, soon thrown aside as useless.

Some time afterwards, however, it fell into the hands of a sensible substantial yeoman; who, with the assistance of a friend, discovered its usefulness, and reduced it to practice.

My father, who had made himself master of the excellencies and defects of this pattern, made one from it, with some improvements. This was the first which was made in the District, and perhaps the first which was made in England.

The utility of these being seen by some discerning individuals, several others were constructed under my father's direction. But, notwithstanding many of them were kept in common use, and visited as subjects of admiration, it was some fifteen or twenty years before they grew into popular estimation.

Within the last ten or fifteen years, the making of them has been a principal employment of wrights and carpenters. At present there is scarcely any man, whose farming is considerable, without a "Machine Fan."

The CONSTRUCTION of this machine has undergone several alterations, and some few improvements may have been made in it; none of them, however, of moment, except that of changing the materials of the sails from boards to sheet-iron. Its complexity is the only bar to its popularity.

Should

Should a happy simplification of it be hit upon, it must inevitably rush into universal practice.

The present *price* about five guineas.

Its *uses* will be spoken of under **BAROMETER MANAGEMENT.**

17.

THE WEATHER.

THE BAROMETER here, as in other places, has its advocates and its revilers. But neither of them appear to view it in its true light. The former speak well of it, because it has more than once saved their hay or their corn from damage: the latter revile, or perhaps break it, because they have been caught in the rain when the *weather-glass* was above *changeable*: expecting that the *glass* should indicate the weather with the same precision that a clock or a watch does the time of the day.

But

But this is somewhat unreasonable: it would, indeed, be equally philosophical to quarrel with the scales when the guinea is under weight. It is quarrelling with the laws of nature, not with a glass tube and quicksilver.

All that the barometer pretends to is to ascertain the WEIGHT OF THE ATMOSPHERE, which it does with great delicacy and accuracy: it is beyond the power of *mechanism* to form so fine a balance.

To the ridiculous tables of the Jews and *ether* makers (who ought to have judged better) we must ascribe those disappointments which have brought their instrument into undeserved disrepute. If instead of *fair, rain,* and *changeable,* they had substituted *heavy, light,* and *medium,* or merely a scale of degrees, the barometer would have been considered what it really is, a balance for ascertaining the weight of the atmosphere; not what it never was or can be, *in itself,* an infallible prognosticator of the weather.

In a former work * I digested my ideas on this subject fully and circumspcctly. It is

now

* EXPERIMENTS and OBSERVATIONS concerning AGRICULTURE and the WEATHER.

now more than seven years since that work was written; during which period I have continued to pay, in the summer months of almost every year, strict attention to the weather. My success has been *almost uniform*, much beyond any thing my expectation could have suggested.

My THEORY and PRACTICE still remain unchanged. The SETTING SUN and the BAROMETER, taken *jointly, not separately*, have been my *chief* dependance: other APPEARANCES, the WIND, and the degree of HEAT, have, in doubtful cases, lent their assistance.

What I mean to say further on the subject at present is, to recommend to every man concerned in matters of husbandry to pay due attention to the weather. I know from my own experience (even though I may have been in some degree *fortunate*) that much may be saved by it.

He must not, however, expect that a foreknowledge of the weather is readily learnt: like holding the plow, and judging the quality of stock, it requires considerable PRACTICE.

In hay-time and harvest, let him give an eye to atmospherical appearances, and attend to the setting sun as a *business* of the first importance; and let him consider his barometer as a *useful implement of husbandry*.

In the course of a few summers he will find himself enabled to foresee the weather with the same kind of PRACTICAL KNOWLEDGE as that which tells him what hay is fit for the stack, and which bullock will pay best for grazing.

The PROGRESS OF SPRING, 1787, Pickering, Yorkshire.

The grosberry foliated,—10 March.

The fallow in full blow,—5 April.

One swallow, near water,—12 April.

White-thorn foliated,—18 April.

Swallows about houses,—27 April.

Cuckow first heard,—6 May.

Swifts,—12 May.

Oak foliated,—29 May.

Hawthorn blowed, 10 June.

Ash foliated,—11 June.

During May, cold pinching winds; and in the beginning of June, a very smart frost.

Query.

Query, Do these circumstances account for the unusual difference in the time of foliation of the oak and the ash, and the blowing of the hawthorn; which in a common year happen within a few days of each other? The roots of the oak lie low; those of the ash and hawthorn superficially.

In June, heavy rains set in; and continued, almost without intermission, until December. So wet a summer has seldom—perhaps scarcely ever—happened. Hay in general was spoilt; and thousands of acres of corn were little less than wasted in the field! a circumstance, perhaps, entirely new in the annals of husbandry. I never before knew a season which did not afford a time (to those who had patience to wait for it,) for harvesting hay and corn in *tolerable* condition. But this year, the late-ripe crops upon the Wolds, the Northern Heights, and in the Morelands, were *inevitably* little less than lost. During the latter harvest there were not, I believe, two fair days together, until near Christmas! the corn which was carried was of course spoilt in the stack or mow. Hogs were
bought

bought up, and turned loose among the sheaves in the field !*

Another remarkable circumstance of this season was the extraordinary STRENGTH OF VEGETATION, which was equally manifest in the garden and the field. Every thing was *out of size*. Some plants quite disfigured. Pasture-grounds over-run with stale grass. In some stinted pastures (grounds let out annually in cowgates to a fixt number of cows) scarcely half the grass was eaten.

These extraordinary exertions of vegetation are, perhaps, to be accounted for in a succession of dry summers terminating in a moist one. The soil, unable to exert itself during the dry seasons, became furnished with extraordinary powers ; to which the moistness of this summer gave full scope.

* Yorkshire was not singular in this disaster. All the Northern counties, I believe, shared a similar fate.

18.

THE

GENERAL MANAGEMENT

OF

F A R M S.

THE HUSBANDRY of the Vale, like that of many other Districts, has undergone a total change by INCLOSURE.

Formerly, the entire margin, and much of the bottom of the Vale lay in open COMMON FIELD; subject, from time immemorial, to the round of

Wheat, barley, or big.

Oats, beans, or other pulse.

Fallow.

Above these fields were extensive COMMON SHEEP WALKS; below them COMMON PASTURES

TURES for cattle and horses, and COMMON MEADOWS for hay.

Under this ancient system of management the produce of the District was small; the fields were unproductive, by incessant plowing, and for want of a change of crops; and the meadows, by being mown year after year without remission, and without any other melioration than what chance floods might partially afford them: while the pasture-grounds, over-run with bushes and weeds, were equally unproductive. The principal part of the entire produce went to the maintenance of the oxen and horses employed in the cultivation of the fields. Even the yeomanry, with all their industry and frugality, starved on their own estates, well foiled as many of them naturally were.

The Inclosures which have taken place within the present century (see the ART. INCLOSURES) have not only changed the system of management, and have increased the *neat* produce of the District perhaps *threefold*; but have inverted, in a remarkable manner, the *comparative* value of lands.

Formerly, the meadow lands were generally esteemed the most valuable part of a township : there have been instances of these lands cold-soiled, wet, distantly situated, and unproductive, being exchanged for common-field lands ; which *at present* being naturally well soiled, situated near a town, now inclosed, and laid down to grass, are of *five* times the value of the old grassland ; some of which still lies in an intermixed unimproved state.

This is the most striking proof I have met with of much being to be done, *in some cases*, by a CHANGE OF GENERAL MANAGEMENT.

This extraordinary improvement has not been effected by the mere circumstance of Inclosure ; but principally by that of changing OLD ARABLE LANDS TO GRASS, AND OLD PASTURE LANDS TO ARABLE. A change which seldom fails, if properly made, of being highly beneficial to the occupier, and is frequently, as in this case, permanently beneficial to an ESTATE.

The *ancient* system of management being now nearly extinct ; and no circumstance of it, except the extreme industry and frugality with which it was conducted, being worth preservation ; I shall proceed to consider the

Vale

Vale as an INCLOSED COUNTRY, and describe its PRESENT GENERAL MANAGEMENT; with the various IMPROVEMENTS which have been made in it during the last twenty or thirty years.

The primary OBJECT of the Vale-Husbandry is

BUTTER,

put down into firkins; the best of it for the London market; the inferior sorts for the manufacturing towns of West Yorkshire.

Cows, barren, or in calf;

OXEN, and some few younger cattle; and

HORSES, principally for the saddle,

have long been staple produce of the Vale; and are annually sent out of it in considerable numbers, principally to the southern markets. Some

BULLOCKS, and great quantities of

SHEEP are fatted, in the Vale and Morelands, for the ports of Whitby and Scarborough. Of late years

BACON has been sent in considerable quantity into the West of Yorkshire, and some to the London market.

RABBITS are not a staple article in the Vale, or on its margins, though some good warrens occur.

With respect to vegetable produce,

RAPE

may be considered as that which brings most money into the country. Since the inclosure of common pastures great quantities of

OATS

have been sent out of the Vale. Also some smaller parcels of

BARLEY and

PULSE

have of late years been sent down the Derwent. But notwithstanding the goodness of the soil, and its fitness for

WHEAT,

very little of this grain has been carried out of the neighbourhood of its growth; having been wholly used in home-consumption. Of late years, however, there has been an overflow; and Whitby has drawn part of its supply from hence.

Besides these articles of MARKET PRODUCE, a variety of *subordinate crops* are raised; as

GRASS,

GRASS, OF NATURAL GRASSES ;
 CLOVER, and other CULTIVATED GRASSES ;
 TURNEPS, for cattle and sheep ;
 POTATOES, for cattle and swine : also
 FLAX (manufactured in the Vale) ;
 TOBACCO.

But before the methods of raising these crops, and of obtaining their productions, can be separately described, a variety of general subjects require to be spoken of ; namely,

THE SUCCESSION of crops and fallow ;
 SOILS, and the method of CULTURE ;
 MANURES, and the mode of APPLICATION ;
 SEEDS, and the general methods of SOWING ;
 WEEDS and VERMIN ;
 HARVESTING crops in general ;
 FARM-YARD MANAGEMENT ;
 MARKETS.

19.

S U C C E S S I O N .

NO REGULAR SUCCESSION of arable crops and fallow can be traced in this District. Every man follows the dictates of his own judgment, and subjects his arable land to such uses as are best suited to the general economy of his farm in the given year.

This mode of management is not peculiar to the Vale under observation, but is common to other Districts in which GRASSLAND predominates; under which circumstance *aration* is considered as a secondary, and in most cases a *subordinate* branch of management.

When the sward becomes unproductive it is delivered over to the plow, and the soil kept in an arable state until another piece of sward begins to fail; when the former is laid down again to grass, and the latter broke up for arable.

In the Midland counties, where this alternacy of grafs and corn has, in some instances, been in practice time immemorial, a regular course of husbandry has taken place. But here, where this system of management is in its infancy, and where the diversity of soils is almost endless, no regular round of management can, with propriety, be at present pursued.

Land which has been kept in TILLAGE century after century, is prone to grafs, and will *retain its sward* much longer than land which has been only a few years under the plow. And a RICH SOIL, COOLLY SITUATED, will *retain its sward* much longer than thin-soiled upland.

There are numberless instances in which the richer cooler parts of the early-inclosed common-field land have now lain more than *half a century* in GRASS: nevertheless the *sward*, though perhaps mown year after year, and treated with no extraordinary care, *still remains unimpaired*: the herbage well sorted, and the produce ample.

Therefore, to subject the lands of this District, circumstanced as they are, *at present,*

sent, to any METHODICAL ARRANGEMENT, or REGULAR ROUND OF CROPS, would be an evident impropriety*.

20.

S O I L S

A N D

S O I L P R O C E S S E S.

THIS COMPLEX subject requires, in the present instance, the following arrangement.

1. Species.
2. Sub-soils and under-draining.
3. Rough grounds and clearing.
4. Tillage.

I. SPECIES. The great diversity of soils which the Vale and its environs afford has been

* The only particular of the management of the Vale in this respect which appears to me censurable, is that of suffering *thin-soiled, thirsty upland* to lie in a state of *seward*, perhaps as "meadow" (mowing ground,) when it would, I apprehend, pay much better in a course of ARABLE MANAGEMENT. Turneps, barley, wheat, and the cultivated grasses, equally affect it.

been mentioned. Viewed in this light, it is a *specimen* of country which admits not, perhaps, of comparison. Within the narrow limits of a few miles BARREN HEATH and RICH FEN LANDS are included; with almost every intermediate soil: unproductive GRITSTONE SAND; thin-soiled LIMESTONE LOAM; deeper and more productive “RED-STONE LAND *;” rich deep PEBBLY LOAM †; strong

* RED-STONE LAND.—This singular species of soil is composed of loam of different qualities, intermixed with a greater or less quantity of soft sandy stones, about the ordinary size of flints, and of a dark yellow or orange colour; a species of grit, or free-stone. The cultivated soil is in some instances nearly half of it made up of these stones; which, some men are of opinion, afford in themselves a degree of nutriment to corn crops. An instance is mentioned, in which a great quantity of these stones having been gathered off as an incumbrance to the soil, its productiveness was much lowered; but the stones being returned, the soil also returned to its former state of fertility. Be this as it may, the soil under notice is beyond dispute one of the finest *corn* soils in the island.

† PEBBLY LOAM. This soil is noticed as being, taken all in all, the most *useful* soil I have any where yet observed. It is equally productive of *corn* or *grass*; may be worked as *arable land* in any season; and is found enough in *grass* to bear stock in winter. I particularize

strong blue CLAY. And what renders this circumstance still more remarkable, there are instances in which the several species of soil here enumerated are included within the same farm.

A farm thus variously soiled is a spur to ingenuity; obliging its occupier to break through those confined opinions and narrow prejudices, which are too frequently contracted in countries where a UNIFORMITY OF SOIL, and a REGULAR ROUTINE OF MANAGEMENT prevail.

This may account, in some measure, for the SPIRIT OF IMPROVEMENT so conspicuous among the HUSBANDMEN of the country under survey.

II. SUBSOILS. The FEET and SIDES OF HILLS generally abound in LANDSPRINGS and COLD WET SUBSOILS, caused by the waters absorbed by the upper parts of the swells lodging and striving for vent in the lower regions.

From the cloud of hills which rise to the north of this Vale, it might be expected that
a vein

icularize these soils as they may hereafter, with a variety of others, form a separate subject of investigation.

a vein of cold land would be found on its margin; but observation proves the contrary.

The waters of the morelands find vent in the dales and dingles with which they are intersected; and are entirely cut off from the Vale by a deep valley which lies between the moreland swells and the range of limestone heights which form the immediate banks of the Vale; while the heights themselves, being in all human probability formed entirely of rock, receive into their bosoms the waters which they absorb, and which sink below their bases, or rise in rocky fountains at their feet.

Near Pickering the RIVER COSTA takes its rise; not gushing forth as from the mouth of a cavern, but rising at numberless apertures through a filter of sand, which has probably been brought out of the fissures of the rock; the entire river, or rather river-like brook, rising within the compass of a few acres.

It is a fact worthy of attention, though perhaps easily to be accounted for, that a tract of country containing perhaps twenty square miles, lying above this efflux, has scarcely

scarcely another SPRING belonging to it, nor scarcely a perch of SPRINGY SOIL upon its surface.

The limestone and redstone land lies all on ROCK above the level of this spring. The pebbly loam which lies below it is equally fortunate in a seam of GRAVEL, which, tho' it lie some feet beneath the surface, renders it sufficiently dry to be worked at all seasons, and to carry stock in winter with impunity.

Under these circumstances UNDERDRAINING is rendered useless; and no instance of it occurs in this neighbourhood, except in the improved peatbog, which was mentioned under the article PLANTING, and which lies in the immediate vicinity of the source of the Costa; by whose waters, before the channel of the river was made, that bed of moor had been formed. The wetter parts of the area received considerable improvement from underdraining.

But altho' the substructure of the MARGIN is such as to preclude the use of underdraining, that of the *swells* which rise in the BOTTOM OF THE VALE renders this operation frequently necessary; and in some few instances it has been practised with great success.

In the instance which I most particularly attended to, thirty acres of cold unproductive land, lying on the skirt of one of those hillocks, was, by underdraining, improved to more than twice its former value. From a state of rushy ill-grassed sward, it was raised first to a piece of productive corn land, and is now a sound well-herbaged grazing-ground.

The MATERIALS wood. No stones in that neighbourhood.

In the MORELAND DALES underdraining would in many cases be a valuable improvement; and there *stones*, the most eligible material, are abundant.

The OFFAL FREESTONES which lie an incumbrance to the quarries of the margin, would pay well for carriage into the bottom of the Vale.

III. CLEANING ROUGH GROUNDS. The inclosures of COMMONS and WASTE LANDS which have of late years taken place, have directed the attention of husbandmen toward the clearing and breaking up such lands for the purposes of AGRICULTURE.

I. **SODBURNING.** The practice which has gained the greatest estimation is that of **SODBURNING**—provincially, “paring and burning:”—a practice which is little known in many parts of the island; but which ought to be well understood by every husbandman in it.

I. *Paring.* The bushes and other incumbrances of the surface being removed, the sward is inverted with the breast-plow,—provincially, “paring spade,”—in fods about a foot wide and three feet long.

The *judgment* requisite in this stage of the process lies chiefly in determining the proper **THICKNESS** of the fods. If they be pared too thick, they are difficult to burn; if too thin, the sward is not effectually destroyed, and the produce of ashes is too small. A rough spongy surface ought to be pared thicker than one which is firm and bare of grass; and a light shallow soil ought to be pared thinner than one which is deeper and more tenacious. An inch may be considered as the medium thickness.

The *attention* required in this part of the business is principally to see that men, who work by the acre, break off the fods at proper lengths,

lengths, and clear them effectually at their outer edges.

The *price* ten to twelve shillings an acre, varying principally with the freeness of the soil. Roots are detrimental, but stones are the greatest enemies to the paring-spade.

2. *Burning*. If the sods be naked and the season moist, they are “set” on-edge to dry; if grassy, and the weather be fine, this labour may with propriety be spared.

The *method* of burning is invariably in *small heaps**, a rod or less asunder according to the quantity of sod; but the way of *forming the heaps* is not fixed.

The bottom is generally made in a round form, about a yard in diameter, with sods set on-edge. On the windward side of this bottom, some lay a bough of furze or other kindling with the end out, covering it above with the grassiest and driest bits of sod; and then make up the heap in the form of a small hay-cock, keeping the sods on the inside as hollow as may be, but laying them flat and close on the outside to keep in the fire.

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The

* For the greater conveniency of burning the sods, as well as of spreading the ashes.

The heaps made in this manner are set on fire with a bough of lighted furze,—or, which is better, a link made of tow dipped in tar and wound round a small stake or other stick;—the lighter running along the rows from heap to heap, setting fire to the kindling.

Others, having formed the bottom as above described, carry up the heap with a *chimney* in the middle, kindling it with a shovel-full of hot ashes thrown down the chimney. When kindling-materials are scarce, this may be the more eligible method.

When the sods are under-dry, much skill is requisite in forming the heap. The chief art lies in keeping it light and hollow within; and, whether it be made with an *eye* or a *chimney*, in having due regard to the windward-side. A little practice and proper attention will soon supply the rest.

If the heaps be made too large at first, their own weight crushes them down, and destroys the necessary openness of the inner side; if too small, the fire, not being sufficiently confined, flies outward, and spends itself prematurely.

The

The heaps well on fire, fresh sods are laid on from time to time, until the whole are expended; not more than half of them perhaps being used in forming the original heaps.

In "beating up" the heaps, the fresh sods are laid on the side on which the fire is the strongest; the addition being seldom made until the fire begins to make its appearance on the outer-side of the heap.

When all the fresh sods are expended, the unburnt pieces which slide down the sides of the heaps and lie round their skirts are laid upon the top, and the whole reduced to ashes.

The burning is principally done by women, by the day: sometimes the paring and burning are let together by the acre. The *price of burning* five to six shillings an acre.

3. *Ashes.* The most general method, and that which seems to be in the best esteem, is to spread the ashes as soon as they are cool, or perhaps while yet warm, and to plow the land immediately for the crop, with a *shallow furrow*, to prevent the ashes from being buried too deep in the soil.

Sometimes the soil is only *rice balked*, not plowed clean.

Perhaps the most effectual method of mixing the ashes with the soil, the great thing to be desired, would be first to *rice-balk* across the ridges, and then to gather them up with a clean plowing.

This summer has afforded me an opportunity of observing a singular INNOVATION in the art of fod-burning.

Instead of the fods being dried and burnt, and the ashes spread on the *pared surface*, and *plowed in* under furrow, the land, in this instance, was plowed immediately as the paring was finished, the fods dried and burnt, and the ashes spread upon the *plowed surface*, to be harrowed in with the seed as a *topdressing*.

In executing this method, the ridges of the lands were cleared, five or six feet wide, by throwing back the fods into the sides of the lands; and, as the ground was plowed, the fods were returned to nearly their former situation, being thrown on rough over the plowed ground. One plow took about three women, at tenpence a day, to follow it. The extra *expence* half-a-crown to three shillings an acre.

The

The *advantages* proposed by this novel practice are these: first, that of securing a burning season with a degree of certainty, and without the expence of “setting” the fods, which being kept hollow underneath by the inequalities of the plowed surface, a free circulation of air is admitted, and the evil effect of regrowing to the ground entirely prevented; and secondly, those of mixing the ashes more intimately and more evenly with the soil, and of preventing their being buried too deep by the first plowing; which, in this instance, was necessarily given very deep, the soil being of a moory nature, and in a state too tender and moist to be plowed with a shallow furrow, which would not have laid the surface sufficiently dry for turneps,—the intended crop.

Therefore, in this case, the management was obviously judicious: and whether the advantages of FORWARDING THE DRYING, and of being able to use the ashes as a TOP-DRESSING, may not render the practice generally eligible, can be ascertained only by experience.

4. The *time* of sod-burning depends upon the *season* and the intended *crop*.

It is always unadvisable to pare in a *wet season*. The covering moist and feeble, and the sod soft with wet, fall heavy and flat to the ground. The grass soon rots; and if the season continue moist, the roots will in a little time regain a footing in the soil.

On the contrary, sods pared in *dry weather* fall light off the spade, and are kept hollow underneath by the grass or other covering, which in a dry season are rigid, bearing the sods from the ground, thereby admitting a circulation of air beneath them; by which means the extra expence and trouble of *setting* is avoided, and the process of cineration rendered much less difficult and irksome.

The *CROP*, therefore, ought to be in some measure subservient to the *SEASON*.

5. *The crops* most in use for sod-burnt land are WHEAT, RAPE, TURNEPS, BIG, OATS. It is seldom, however, that a paring season can be got early enough in the spring for either of the latter crops; the last more especially. Big, however, is frequently sown on burnt land the latter end of May, or the beginning
of

of June with success. RAPE and TURNEPS are the most general crops, and upon the whole, perhaps, are the most eligible : the month of June is a leisure-time, and generally a good burning season. However, WHEAT, provided the land were fallowed, and the soil and ashes mixed together by repeated plowings and harrowings between the burning season and seed-time, does not appear to be an ineligible crop.

There have been instances, I am told, in which the ashes (having been spread in the middle of summer) were suffered to be grown over with grass ; which being turned under in autumn, WHEAT has been sown on one plowing with good success.

GENERAL OBSERVATIONS. Sod-burning appears to be one of the sources of real improvement, which being yet imperfectly understood, require every effort of the farmer and the philosopher to raise them nearer to perfection.

At present, the practice is confined to a few Districts : and in those it was applied to particular purposes only : while this principal part of the kingdom is a stranger to its uses.

It does not appear to be considered even in this District as a GENERAL SOURCE OF MANURE; but merely as being applicable to the reduction of *old tough sward*.

For even here, where it has long been in common practice among discerning husbandmen, there are men, who still see it as a bugbear, too terrible to become familiar with. The false notion of "fending the soil into the clouds," frightens some; while the better-founded idea of reducing it all to ashes—by too frequent repetition of this operation—is a stumbling-block to others.

Whoever will attend to the quantity of earth in the fods, and the quantity of ashes produced from them, will lose his fears about the *soil* being *lessened* by this operation.

Supposing the fod to be an inch thick; not more than one-fourth of it, perhaps, is *soil*; and this, so far from being *reduced* in bulk to an alarming degree, is perhaps *increased* in size by the action of the fire; which by leaving it in an open porous state, renders it *more bulky* than the same soil, shook from the fods, and reduced to a perfect state of dryness only, would *probably* have been.

I will not contend for the *increase*, nor will I, at present, admit that the soil is *lessened* by the operation. Different soils are acted upon in different ways by fire : CLAY burns to *hard cinders*, of the nature of *brick*, remaining in the soil *unaltered by time* ; while the cinders of lighter soils are more perishable.

These effects of sod-burning do not appear to have been attended to. Its use in reducing tough sward strikes every one ; and its effect as a manure, in the cases in which it is usually applied, is here clearly understood by those who are best acquainted with its manner of acting.

BUT its effect in IMPROVING THE TEXTURE OF STRONG COHESIVE SOILS has escaped general notice. Yet how could art devise an ingredient more likely to give openness and freedom to a close-textured soil than rough, porous, unperishable ashes ? a material of improvement which the soil itself supplies, free of cost. The *immediate* acquisition of MANURE repays the expence of the operation. The more PERMANENT IMPROVEMENT of the TEXTURE of the SOIL is of course obtained without expence.

Viewed

Viewed in this light, SOD-BURNING, whatever effect it may have on light porous soils, is, in all human probability, a cardinal improvement of soils of a CLOSE CLAYEY NATURE: and it appears to me a matter incumbent on every possessor of such soils to try, on a small scale at least, the effect of a FREQUENT REPETITION of this operation.

2. FURZE-GROUNDS. It is the opinion of one who has paid close attention to the subject, that *old furze-grounds*, off which fuel having been repeatedly carried, are of course much depauperated, may in general be improved in the following manner.

Grub; sow grass-seeds, on the grubbed surface, without plowing; and let the land remain in this state until it has acquired a degree of firmness, the smaller roots left in it are decayed, and the surface has got a covering. Then sod-burn, lime, &c. and break up the soil for a course of arable crops: closing with cultivated grass. When the furzes begin again to grow troublesome, repeat the sod-burning.

3. WOODLANDS. The same inventive husbandman has struck out a simple and certain method

method of freeing grassland from the SLOETHORN,—one of the hardiest *shrubs* which husbandry has to contend with.

If black-thorns be *grubbed up by the roots*, every fibril left in the soil produces a fresh plant ; so that instead of being lessened by this tedious and expensive operation, their number is increased.

If they be *felled above-ground*, the stubs are in the way of the sith and the bite of cattle ; and the thicket is presently renewed.

But if they be CUT OFF LEVEL WITH THE SURFACE, the sith has free sweep, and the young shoots are of course removed with ease and certainty.

If the ground be mown for hay, the same stroke which cuts the herbage takes off the ligneous shoots.

If pastured, cattle and sheep, provided they have no *woodland* left to brouze among, will gnaw them to the quick ; scarcely leaving a stem or a stump remaining. It is, however, always adviseable in *this* case to sweep the ground over with the sith in the course of summer ; to remove effectually the remains which may have escaped the bite of the pasturing stock.

The second year the *shoots* rise weak ; and the *roots* themselves seldom survive the third year.

In a very few years more the roots are found entirely rotten ; thus becoming a source of nutriment to the crop, instead of remaining a nuisance.

If a thicket or a border, whose *sward* is nearly lost, be treated in this manner, rubbish of every kind should be raked off, a few GRASS SEEDS scattered on, and the surface run over with a roller, as a preparation for the sward.

This mode of extirpation is not applicable to the SLOE-THORN alone ; but to the OAK, the ASH, the WHITE-THORN, the MAPLE, and every other tree and shrub to which it has been applied,—the FURZE and the BRAMBLE excepted.

GEN. OBSERV. It is, I believe, a universal practice, when WOODLAND is given up to HUSBANDRY, to take up all the *roots*, large or small, at an expence, perhaps, equal to half the value of the land ; which, in this case, is subjected immediately to the *plow* : altogether

ther the most rugged operation which husbandry is acquainted with.

But how much more eligible would it be to treat such land in the manner above described? keeping it in a state of GRASS until the *roots were decayed*, and rendered obedient to the share.

The sums of money (not to mention the fortunes) which have lately been expended in the improvement of ENFIELD CHACE, are too well known; and will, it is to be feared, throw a damp on the further improvement of the ROYAL WASTES; a matter of some importance to these kingdoms,

But how easily, and with what certainty, might these wastes be improved? The wood upon most of them is doubly sufficient to make the necessary IMPROVEMENT.

Take down the TIMBER TREES and POLLARDS; by grub-felling, in the Norfolk manner: remove such of the LARGER ROOTS as will pay amply for removing; and fill up the holes with the cores of ant-hill or other protuberances with which these wastes generally

rally abound ; sowing grafs seeds on the surface.

Treat the UNDER and other BRUSH WOOD in the manner above described ; and let the whole lie in GRASS, keeping it carefully swept with the sith, until the REMAINING ROOTS be sufficiently DECAYED.

Then, *but not before*, bring the soil under a course of ARABLE MANAGEMENT.

The fencing, the castration of ant-hills *, and perhaps doing away a few other roughnesses, would be the only labour requisite which would not more than repay itself †.

The ROOTS, instead of being a principal cause of EXPENCE and ANXIETY, would, under this management, become a source of IMPROVEMENT OF THE SOIL ; while the EXPENCE of bringing the soil under a course of ARABLE MANAGEMENT would be in a manner precluded by having a *free grassy surface* for the purpose of SOD-BURNING.

This township (part of the ancient forest of Pickering) affords at present (August 1787)

* See Norf. ECON. MIN. 50.

† If DRAINING should be found requisite, how suitable an opportunity while land remains in grafs.

1787) numberless instances of the great UTILITY OF SOD-BURNING MAIDENSWARD.

In adjoining allotments (see the Art. INCLOSURES) without a shade of difference as to soil or situation, the crop, after sod-burning, is in some instances *fourfold* that of the crop sown on one plowing of the natural sward; notwithstanding the favourableness of this summer towards the latter process. Had the season proved *dry*, oats sown on one plowing of the *thinner* soils must have perished; or at best must have remained in a dwarfish unharvestable state. There are oats, even this year, not six inches high; and others, too weak and straggling to ripen as a crop, have been swept over and raked together as fodder.

It is observable, however, that, on the *deeper* soils, there are, this year, some fine crops of oats on the natural sward.

The cause of this disparity between the produce of deep and shallow soils is obvious.

The surface of soils which have remained from century to century in a state of SWARD, is in a manner wholly occupied by the roots
of

of grasses and other plants; forming a *tough mat of fibres*; reaching, in some cases, several inches deep; especially over a cold moist subsoil; where the sedgey tribe are frequently in full possession.

If the soil be THIN, it is *wholly occupied by roots*: the bottoms of the furrows afford *no loose mould* for covering the seed; which either lies exposed on the surface, or falls through the seams upon an infertile subsoil, and among grass, still perhaps in a growing state. The few grains which happen to get buried in the mould flourish while their own substance lasts; but the kernel being exhausted, the rootlings look out in vain for foreign sustenance; the soil is already occupied by veteran roots too powerful for the infant fibrils to contend with.

But if the soil be DEEPER THAN THE SWARD, the seeds get properly covered, and the young plants have fresh mould to strike root in; and to support them until the sward die, decay, and afford nourishment to the rising crop.

The USES OF SOD-BURNING *thick-swarded soils* are those of effectually *killing the sward*; doing

doing away the *toughness of the furrow*, and furnishing in the ashes a supply of acceptable *pabulum* to the infant plants.

Out of this statement of effects result these general conclusions.

Rich, deep soils, though covered with old sward, may be sown with corn on ONE PLOWING.

It is reasonable, however, that this plowing should be given some time before the seed be sown, for the double purpose of exposing the bottoms of the furrows to the meliorating influence of the sun and air, from which they may have long been estranged; and of FORWARDING THE DIGESTION OF THE SWARD.

It is likewise observable, that in this case a DOUBLE PLOWING (burying the sod at the bottom of the furrow) is obviously preferable to a single one.

But *shallow, less fertile soils* will not bear this treatment: they require either to be SOD-BURNT or SUMMER-FALLOWED, to reduce the sward and meliorate the soil.

But fallowing is expensive, loses one year's crop, and does not change the texture of co-

HESIVE SOIL; to which, whether deep or shallow, sod-burning appears to be singularly well adapted.

The length of these reflections will, I trust, find an excuse in the magnitude of the subject which gives rise to them. The ROYAL FORESTS at present afford little benefit to the community; but are no doubt capable of affording great national advantage. To endeavour to forward their improvement by pointing out the easiest method of accomplishing it, is therefore the duty of every man whose experience has led him to reflections on the subject.

Improvements thus conducted would be progressive and pleasurable; requiring no extraordinary share either of attention or capital.

IV. TILLAGE. In a country in which GRASSLAND is the PRIMARY OBJECT, excellency in the minutiae of the ARABLE PROCESSES must not be expected: nevertheless, where the invention is let loose, and a spirit of improvement prevails, we may hope to find some SPECIAL MATTER worth notice.

The

The only particulars which appear to me noticeable in this place are,

1. Plowing with reins,
2. Laying lands across slopes.

I. **PLOWING WITH REINS.** In this respect, the husbandmen of the Vale excel. Various as are their soils, they plow them invariably with **TWO HORSES**, driven and guided with **WHIP-REINS**.

Proper *seasons* for the operation are endeavoured to be caught; but, even with this advantage, it is matter of astonishment how some of their strong deep soils are turned by a pair of light slender horses; which, in a balance, would barely outweigh one of the four (or perhaps six) which are used upon the hills of Surrey and Kent in plowing soils of less tenacity!

In Norfolk the soil is light, and the great merit of the Norfolk husbandmen lies in their expedition. Here, where the custom is to go only *one journey*, the quantity plowed in a day is much less than in Norfolk; but generally more, even in the stronger soils, than is done by two men and four expensive horses in many other places.

It has been a generally received idea, even among men who think liberally, and are inclined to think well of the practice of plowing with a pair of horses, that it is only applicable to LIGHT THIN SOILS. But the established husbandry of this country proves that idea to be erroneous.

It strikes me, however, advocate as I am for the practice, that in some cases, especially where the soil is DEEP AND TENDER, three horses at length would be preferable.

But the plea held out against this management is, "We cannot afford it!" The truth is, land here has got up to the TWO-HORSE-PLOW PRICE; and tenants seem to be aware that they cannot pay their rents, if they send more than two horses and one man to plow. What a strong recommendation is this of the practice.

2. LAYING LANDS ACROSS THE SLOPES OF HILLS. The general practice, unless where the turnwrest plow is in use, is to plow the sides of hills *up-and-down*, laying the lands parallel with the line of descent, not obliquely across it.

Where

Where the SUBSOIL is *absorbent*, this is perhaps the most eligible method; the rain-water which falls being by this means effectually prevented from making its escape off the side of the hill. For, unless *ridges* be raised very high, the water in this case has no propensity toward the furrows on either side; its tendency, when the *lands* lie flat, being down lines lying parallel between them: consequently, the rain-water which falls upon them may run from the top to the bottom of the hill, without finding its way into the *interfurrows*, which in this case are rendered *entirely useless* as SURFACE-DRAINS.

This circumstance renders the common method of plowing hill-sides altogether ineligible where the SUBSOIL is *cold* and *retentive*; and where the SURFACE-WATER is of course required to be got rid of the *quickest* and *shortest* way.

To this end the lands are thrown ACROSS THE SLOPE, nearly parallel with the horizon, barely giving them *sufficient descent* for water to find its way along the interfurrows.

The EFFECT of laying the lands in this direction is evident: the rain-water which falls

upon them has never farther to run than the width of the *land* it falls on ; (even supposing it to fall on the upper edge) for so soon as it is caught by an interfurrow, the vegetable pasture is in effect relieved from it.

Hence, the narrower the lands, provided the interfurrows be sufficiently deep, the more immediate the effect.

The only INCONVENIENCY of laying lands across the slope is that of having the *plits* on the lower sides of the lands *to turn against the hill* ; an operation which requires a good workman to do it properly.

But there is an ADVANTAGE in this method which more than overbalances that inconvenience. The PULL is always upon, or nearly upon, LEVEL GROUND ; whereas, in the common direction of the lands, the uphill pull is intolerable to the beasts of draught, especially to horses ; which, through fear or impatience, draw by jerks, eager to reach the top of the hill ; thereby fatiguing themselves and the plowman unnecessarily, and rendering the work defective.

The good effect of laying lands across slopes, is not only plausible in theory, but is
verified

verified by practice. I have seen an instance in which land, which had heretofore been *cold* and *poachy*, improved, merely by changing the direction of the ridges, to DRY, SOUND, PRODUCTIVE soil, worth nearly *twice* the rent it was before this simple alteration took place.

21.

M A N U R E S

AND

M A N U R E P R O C E S S.

THE SPECIES OF MANURE principally used in the District are,

Dung,

Lime,

Ashes ;

the last chiefly in the MORELANDS, where great quantities of turf and peat are burnt upon the hearth, for the double purpose of

FUEL and MANURE ; the ashes being considered as equivalent to the expence of collecting the materials.

Marl

is not found in quantity, *as a fossil*, either in the Vale or Morelands. The only marl which has been used as a manure is a produce of *petrification*. This marl and the fountain from whence it flows are noticeable.

The waters of “NEWTON-DALE-WELL” have long been celebrated for their virtues in cold-bathing ; and for strengthening the limbs of children they are, I believe, celebrated justly. An anniversary relative to these waters has been observed time immemorial, and is still observed by the neighbouring youth, who meet at this spring upon some certain Sunday in the summer months to bathe ; and— a poetic mind would add,—to celebrate the virtues of the water.

The situation of this spring is singularly wild and romantic : the country on every side mountainous and barren, excepting the narrow dale, or cultivated chasm, near the head of which the spring is situated.

At

At the time these mountains and this chasm were formed, it is probable the water gushed out of the face of a perpendicular rock, which now rises about eighty feet above the spring; but through the mouldering of the rock, and the accumulative effect of the waters, the base of the precipice, out of which they issue, now reaches with a sharp ascent to near the mouth of the spring.

The upper part of the slope at least has evidently been raised by VEGETATION and PETRIFICATION. Had not the hand of *art* been assisting in removing from time to time the accumulated matter, in the form of "marl" and "limestone," and in leading the water by a channel from the rock, the spring might long since, by over-growing its mouth, have been the cause of its own extinction.

These waters, at their source, are remarkably cold and strongly CHALYBEATE to the taste, tinging their bed of a deep rust colour; but as they fall down the base of the hill, they lose by degrees their chalybeate qualities, losing them entirely before they reach the foot of the slope.

What

What is equally observable, their PETRI-FACTIVE quality is, at the source, barely perceptible, and does not acquire its full effect until they have run some twenty or thirty yards down the slope; about which point they lose almost entirely their chalybeate *taste*, though they still continue to *tinge* the channel; the colour growing fainter as the length of channel increases*.

Where the rill meets with no vegetable matter to petrify (or rather to *incrust*), it forms an INCRUSTATION at the bottom of its channel, which in time being filled to the top, the waters overflow, spread over the slope, and incrust every thing which falls in their way; until having found some hollow channel (or perhaps in a state of nature having reached the face of the rock), they form a fresh rill; which being annihilated in the same manner, the waters proceed or return back along the side of the slope; thus forming, in an undisturbed state, a natural cone.

* This spring, which is at least an object of curiosity, and whose waters may contain medical virtues which require to be pointed out, is situated about two miles from *Saberzat-inn*, on the road between PROPPRING and WHIRBY.

Where

Where the surface has been free from moss or other vegetable production, the accumulated matter is WHOLLY CALCAREOUS; of a light colour, resembling the MARL OF NORFOLK, except in its being discoloured more or less with a chalybeate tinge. Where moss, liverwort, and other vegetables have been incrufted, a STONE-LIKE SUBSTANCE is formed: the former is called “marl,”—the latter “stone.”

At present, the face of the slope is hollowed out into great irregularity, by digging for and carrying away the *marl*, leaving masses of *stone*, some of them containing many cubical feet, standing above the present surface.

These stones, though light, being full of hollowneffes within—mere bundles of moss and algæ—have, by being long exposed on the surface, acquired a very great degree of hardness, their smaller asperities being with difficulty broken off.

By immerging the fragments in the acid of sea-salt weakly diluted, the calcareous incrustation is leisurely dissolved, leaving the vegetable matter entire, and to appearance

as

as perfect as when it was first incrusted, tho' it may have lain locked up in that state a thousand or perhaps many thousand years.

These *vegetable stones* have likewise been carried away and burnt as LIMESTONE. The quantity of *lime*, however, produced from them cannot be great ; but mixed with the *ashes* of the vegetables, a valuable manure may nevertheless be formed.

In a situation so recluse, it is no wonder this valuable source of manure should have been in some degree neglected. The bottom of the dale which winds below it, does not appear to have been much benefited, either by the waters themselves or the matter which they have formed. The principal part of that which has been taken away has been carried up a winding road over the top of the mountain to a neighbouring dale (Goadland) some three or four miles distant.

Over and above the difficulty and expence of carriage, a shilling a load has been paid to the lessee of the royalty for these calcareous substances ; not for the purpose of experiment, but in pursuance of established practice ; a sufficient evidence this of their *virtue* as a MANURE.

LIME.

LIME. Lime is a sheet-anchor in the Vale husbandry. It is used invariably, I believe, on every species of soil, and *in most cases* with great success. It seems to be at present a received idea that the business of aration could not be carried on, or at least that the present rents of land could not be paid, without the assistance of lime.

It is not my intention to attempt to prove or disprove the truth of this opinion. Suffice it for me to say, in this place, that I am not acquainted with any country in which lime is held in such high repute, nor where the manufacturing of it is so common a practice among farmers as it is in this. Almost every principal farmer upon the margin burns his own lime.

There are, besides, great number of "sale kilns" for smaller farmers, and for the centre of the Vale, where no materials for burning are to be had. There is an instance of one man occupying eight or ten kilns; burning two or three thousand chaldrons yearly.

The LIME-HUSBANDRY of this District, therefore, merits particular notice. The subject requires the following division :

I. The

1. The materials burnt.
2. The method of burning.
3. The cost, and the selling price.
4. The soils, and the crops to which it is applied.
5. The method of applying.

1. MATERIALS. On the NORTHERN MARGIN of the Vale, lime is burnt solely from *stones*, of different colours and contextures. The species most prevalent are a strong light-coloured GRANATE, and a species of blue and white MARBLE; the blocks, whether large or small, being blue at the core, and lighter-coloured toward the outer surface. These stones are hard, ponderous, and almost purely calcareous.

One hundred grains of the former, taken from a lower stratum of PICKERING-CASTLE-BANK, yield forty-three grains of air, and ninety-four grains of calcareous earth, leaving a residuum of six grains, chiefly a brown silt, with a few gypsum-like fragments.

One hundred grains of the latter, taken from the lower stratum of a quarry near KIRBYMOORSIDE, afford thirty nine grains
of

of air, eighty-six and a half grains of dissoluble matter, and thirteen and a half grains of residuum, fine impalpable silt.

The lime produced from the former is of a dusky colour, and falls in rough coarse granules; that of the latter bursts into a white volatile flour-like powder.

The stones of different quarries are different in quality, but none of them differ widely from the specimens above described*.

On the SOUTHERN HEIGHTS the prevailing material is a singular species of SOFT GRANATE. Its colour a dirty white: its texture resembling the grains of white mustard-seed run together with a cement of chalk or marl. The hardness of this *stone* (if it merit the name) increases with the depth of the quarry. The lower blocks are used in building; but the upper stratum, for three or four feet below the soil, is generally a STONE-MARL of no mean quality, but varies in different quarries. I have not learnt, however, that in any instance it has been applied as a MANURE. On the contrary, it appears to be

* For a description of the QUARRIES of these stones, see Art. BUILDING MATERIALS, page 105, note.

be universally cast, as an incumbrance, to the bottom of the quarry*.

One hundred grains of the MALTON GRANATE; taken from the middle of the quarry opposite the Lodge at New-Malton, yield forty-four grains of air, and ninety-seven grains of calcareous earth; leaving three grains of residuum, chiefly a brown silt.

But the stones of different quarries vary in quality. One hundred grains taken from a newly-opened quarry, by the side of the road leading from Malton to Castle-Howard, yield only ninety-four grains of dissoluble matter.

I men-

* On this side of the Vale, too, the limestone rubble which lies between the soil and the rock, is much of it of the nature of MARL, and might in many cases be applied as such with advantage. Its effect, where it has been thrown back from the edges of the quarries on Scallow-moor (a light loam inclining to a black moory soil) above Pickering; is striking. The earth of this rubble is strongly calcareous; and its stones are frequently covered with a white efflorescence which is purely calcareous. Great quantities of it might be collected; and where a fit soil can be found (by trying experiments with it on a small scale) in the neighbourhood of a quarry, it would in all probability pay amply for setting on. For the bottoming of farm-yards and dunghills, the entire "coping," the soil inclusive, would be found excellent.

1. Building the kiln.
2. Raising and breaking the stones.
3. Coals and their proportion.
4. Filling the kiln.
5. Drawing the kiln.

1. *The kiln.* The materials are either limestone entirely, or limestone lined with bricks on the inside. Neither timber nor mortar ought to be used in building a lime-kiln; the former presently decays, and the latter by alternately swelling and shrinking bursts the walls; besides rendering them in the first instance too tight to admit a proper quantity of air: no other air-holes than the "eyes" at which they are kindled being made in the kilns of this District.

The *form* of the cavity is an irregular cone inverted. At the bottom are generally two eyes opposite to each other; the cavity being here contracted to a thin point, or narrow trough; the width that of the eyes. As the walls are carried up, the cavity takes by degrees a circular, or sometimes an *oval* line; at the same time receiving, as it rises, a *conical* form; until having reached somewhat
more

more than half its intended height, the form is changed to *cylindrical*; or is sometimes *contracted* towards the top. The proportion between the depths and the diameters of these kilns is that of the depth being generally about one and a half diameter of the top.

The *size* varies from six to forty chaldrons.

2. *The stones.* The art of *raising* stones can only be learned by experience in the given quarry in which they are to be raised. They are sometimes raised by the day; sometimes by the load; but most generally the entire labour of burning is taken together at so much a chaldron of lime.

The *breaking* of hard, strong stones is a laborious part of the operation of lime-burning. On the north-side of the Vale it is done by men with large sledge hammers; but on the Malton side, where the stone is soft, women are frequently employed in breaking.

The medium *size* is that of the two hands; but men burning by the chaldron will not, unless well attended to, break them so small: stones nearly as big as the head are sometimes, but very improperly, thrown into the

kiln ; for unless the proportion of coals be unnecessarily large, the outer shell only is burnt to lime, the core remaining a lump of unburnt stone.

3. *Coals.* The morelands for the last fifty years, have furnished the north-side of the Vale with coals for lime-burning, and for an inferior species of fuel. The seam of this coal is thin, and the quality in general very ordinary.

Before the discovery of these coals, lime was burnt with furze and other brushwood ; but notwithstanding the morelands are now nearly exhausted of coals (unless some fresh discovery should be made), the District is relieved from the apprehension of returning again to its ancient mode of burning lime. The Derwent, besides an ample supply of coals for fuel, brings an inferior kind (both of them raised in West-Yorkshire) for the purpose of lime-burning. The eastern end of the Vale is equally fortunate in this respect, by having the port of Scarborough in its neighbourhood.

The *proportion* of coals and stones varies with the quality of the coals, and likewise,
but

but in a less degree, with the quality of the stone: the method of burning, too, varies the proportion. *Three chaldrons of lime from one of coals* (the measures equal) may be considered as the mean produce. From two and a half to three and a half for one, includes the whole extent of produce of well-burnt lime.

4. *Filling.* Some kindling, and an extraordinary proportion of coals being used at the eyes, and at the bottom, the kiln is filled up with stones and coals, in thin alternate layers; those of stones five or six inches thick; with coals in proportion; the coals, if not sufficiently small, being previously reduced to a gravel-like state; in order to run down more freely between the interstices of the stones, and thereby to mix more evenly with them.

The materials are cast into the kiln with large scuttles; which are filled with stones, by means of an iron-toothed rake, composed of four teeth about six inches long, of a head about a foot long, and a handle about four feet long.

If several men be employed in filling a kiln, it is common for each man to fill and empty his own scuttle. But this is an uncer-

tain, and therefore an improper way of proceeding. Much depends on the regularity and evenness of the layer, and the due proportion of coals; and to judge of this with sufficient accuracy requires some experience, and a steady eye; especially when the kiln is on fire, and the cavity to be filled up is full of smoke. If more than one person be employed in this case, it is highly probable the work will be imperfectly done.

Among the sale-kilns about Malton there is an excellent regulation in this respect. The scuttles are all filled, and brought to the top of the kiln, by WOMEN and BOYS, who deliver them to the MASTER, or his foreman, standing there to receive them, *with his eye fixt within the kiln*; by which means he is enabled to distribute the stones and coals with the greatest accuracy.

5. *Drawing.* There are two species of kilns; or rather one species used in two different ways.

A kiln which is filled, fired, and suffered to burn out before any of its contents be drawn, is called a "STANDING KILN."

If the contents be drawn out at the bottom while the upper part is yet on fire, the vacancy at the top being repeatedly filled up with stone and coal, as the lime is extracted at the bottom, the kiln is termed a “DRAW KILN.”

Since coals have been used in the burning of lime, draw kilns have, until of late years, been most prevalent. But at present standing kilns are most in use.

The reasons given for this change of practice are these: first, that the lime is burnt *evenner* in standing than in draw kilns; in the drawing of which the stones are liable to hang round the sides of the kiln; those in the middle running down in the form of a tunnel; thereby mixing the raw with the half-burnt stones. The consequence is, the outside are burnt too much, the inside too little; the stones too frequently running down to the eye in a half-burnt state. Secondly, the unevenness of surface left by this method, together with the obscurity caused by the smoke, render the *filling difficult*; under-burnt stones, or an unnecessary waste of coals, is the inevitable consequence. A third

argument in favour of standing kilns is, that a *greater proportion* of well-burnt lime may be produced from the same quantity of coals. It is allowed that more kindling fuel is requisite; and, at the bottom, a greater proportion of coals; but the fire by this means getting a strong head, a less proportion of coals are required in the body of the kiln; and what, perhaps, is of still more consequence, less heat is lost at the top of this than of the draw kiln; which is always uncovered, and too frequently hollow and full of cracks; while the top of the standing kiln being piled up in a conical form, and closely covered with sods or rubbish, collects a greater body of fire, and keeps in the heat more effectually.

One circumstance, however, relative to the standing kiln requires to be mentioned. The inside should be *lined with brick*. For every time a kiln which is lined with limestone is suffered to go out, a shell of lime peels off the inside; by which means the walls are soon impaired.

The lime is *drawn* out at the "eyes" with a shovel, and generally carried out in scuttles,
or

or in basket measures, to the cart or waggon.

Of a living kiln the drawing is generally continued until red ashes begin to make their appearance.

But standing kilns are suffered to burn undisturbed until the fire go out; except, perhaps, when the fire is rising toward the top, and a fresh supply of air is wanted, a few shovelfulls are drawn at either eye, by which means an internal hollowness is formed, and fresh vigour given to the fire.

From these circumstances it is plain, that a regular supply of lime cannot be had from less than three standing kilns: one filling; one burning; one drawing. The smaller burners, however, have frequently only two; and for a farmer, one, proportioned to his farm, is sufficient*.

3. COST

* About Brotherton and Nettingley, near FERRY-BRIDGE, from whence vast quantities of lime are sent to distant parts of the Vale of York; particularly toward Easingwood; the kilns are very *shallow* and *wide*; the cone of materials piled *above* the surface, being to appearance equal to the contents of the kiln. This renders the emptying of the kiln very easy; the lime being all thrown from the surface, or through a kind of door-way in the side; not drawn out of the
eyes;

3. COST and PRICE. The ordinary wages for the whole labour of raising, breaking, filling, and drawing, is 18d. to 20d. a chaldron.

At MALTON, the *labour*, if taken by the gross, is about 18d. the price of lime-kiln *coals*, with carriage from the keels to the kiln, about 14s. a chaldron (of thirty-two bushels) the *produce* better than *three for one*. The whole *cost* about 6s. the *selling price* 7s. a chaldron.

At PICKERING, the *labour* is 20d. a chaldron: the price of "moor-coals" and carriage 16s. of "Malton coals" and carriage 18s. The *produce*, if sufficiently burnt, *three to one*. The mean *cost* is therefore about 7s. 6d. the *selling price* 8s. a chaldron. The building and repair of kilns; the wear of tools; the value of the stone in the quarry; and, in some cases, the carriage of it from thence to the kiln, are drawbacks upon the profits

eyes; which are in this case of no other use than to kindle at, and to admit a supply of air. Those kilns are much less expensive than the kilns of *this* District; and more convenient. But query, Do they give as much heat with the same quantity of coals as a taller more cylindrical kiln?

profits which appear in the above calculations. If therefore the stones be *sufficiently burnt*, the neat profit is in this case very small*.

4. SOILS and CROPS. It has already been observed, that lime is applied indiscriminately to every species of *soil*.

On the higher drier lands, its utility is evident.

At Malton, it is laid on the *calcareous quarry soil* with success.

In a comparative experiment, fairly and accurately made on a *redstone soil* above Pickering, with three chaldron of lime an acre; the value of the lime to the first crop, wheat, was not less than two quarters an acre, and
the

* Nothing, perhaps, would encrease the profits of lime-burning in *this* place more than the kiln being filled by the hand of the master, or some judicious person not interested in a waste of coals. It is the interest of men who burn by the chaldron to underbreak the stones, and to make up for the deficiency of labour by an increase of coals; which likewise will make up for neglect, or want of judgement in filling. Let the stones be raised and broken by the chaldron, or the kiln; but let the filling be done by women and boys; by which means industry will be encouraged, and the stones, by passing under the master's eye, will of course be rejected, if not sufficiently broken,

the succeeding crop of oats, (which now are upon the ground, Aug. 1787.) is a still stronger evidence of the great utility of lime *in some cases*: in this case the crop at least *threefold*.

Nevertheless it may be prudent in the occupiers of the *cold moist clays* in the bottom of the Vale to lime with caution.

Its use to the *loose sandy soils* of the West Marshes is, I believe, fully established; yet in a comparative experiment on a *black moory soil* its effect has thus far (the third crop) been *detrimental* rather than serviceable.

It is not my intention to damp the spirit of improvement, but to endeavour to direct it to suitable objects. Nothing, at present, but COMPARATIVE EXPERIMENTS can determine the value of a given lime to a given soil; and no man can, with common prudence, lime any land upon a large scale, until a moral certainty of improvement has been established by experience.

The prevailing crop is *wheat on fallow*. It is also pretty generally set on for *rape, turneps*, or other crop, after *sed burning*, and spread among the ashes. It is also sometimes set on
for

for *barley*. But its effect to the *first crop*, except of wheat or rape, is, I believe, seldom perceptible.

But beneficial as lime undoubtedly is in some cases to CORN, its benefit to GRASS is a matter in dispute, even among the farmers of Yorkshire. Incidents are authenticated in which, to general appearance, it has been *detrimental*.

But without the assistance of *comparison*, the judgment is at a loss to ascertain with any degree of precision the effects of Manures. Nevertheless, general appearances to those who have a knowledge of the nature of the soil, have their weight.

It seems, however, to be a generally received idea, that lime which is laid on for grass is not thrown away; for whenever the land is again turned up, its benefit to corn will have full effect.

5. LIMING. Long as lime has been in common use as a manure, the proper method of applying it to the soil is far from being universally practised.

The *methods* of liming are various.

The

The worst is that of laying it in large heaps, and suffering it to run to a jelly before it be spread upon the land.

Next to this is setting it about the land in *small hillocks*; for although these hillocks be spread before they approach to a state of mortar, this method is injudicious.

Lime which falls in the open air does not fall to powder, but breaks into checquers, or small cubical masses; which being once buried in the soil, may remain in it for ages without being mixt intimately with it.

As far as experience and theory have yet reached, lime ought to be spread in a state of PERFECT POWDER; thereby lodging it in the pores of the soil; and thus, by assimilating the two ingredients, form with them one homogeneous calcareous mass.

A *single stone* exposed to a moist atmosphere falls entirely into *granules*, not into *powder**.

The

* It is observable, however, that much depends upon the nature of the stone from which the lime has been burnt. Stones of a uniform texture, as most marbles, are less liable to fall in granules than stones which are naturally composed of grains, or are divided by fissures into natural fragments.

The smaller the heaps, the nearer they approach to single stones; there is a greater proportion of *surface*, and consequently a greater proportion of *granules*.

It is therefore the practice of judicious husbandmen to set lime upon the land in **LOAD-HEAPS**, and spread it over the soil out of carts, *as soon as it is sufficiently fallen*.

There is an instance of practice in this neighbourhood, and, I believe, only one, which is still superior to that last-mentioned. In this instance, the load-heaps are *turned over*, not so much to finish the falling, as to gain an opportunity of burying the granulous surface of the heaps; by which means the fragments are at least lessened, if not reduced to powder.

In the **MORELANDS** a still better practice is said to prevail. There the heaps are *inter-layered* and *covered up* with moist "*turf-mould*" (the rubbish from peat and turf fuel), which bringing on a rapid fall, the whole is set on fire, and the surface kept free from granules by a covering of dry ashes.

This leads to a general **IMPROVEMENT** in the method of **SLAKING LIME**: Cover up the heaps, whether large or small, with **SOIL**,
either

either of the field they are set in, or that of lanes or ditches carted to them for the purpose ; and if a speedy fall be required, throw water over this covering. See Art. CEMENT, page 121.

If lime be used on *fallow for wheat*, it is generally spread on in *July* ; good farmers making a point of *barrowing it in as fast as it is spread*, and plowing it under with a shallow furrow, as soon as convenient.

The usual *quantity* set on is three to four chaldrons an acre.

DUNG. Nothing sufficiently noticeable respecting this species of manure has occurred to me, excepting some incidents relating to the manuring of grassland, which will appear under the head NATURAL GRASSES ; and excepting a general deficiency in Farm-yard Economy, for which see FARM-YARD MANAGEMENT.

SOWING.

22.

S O W I N G.

THE SPIRIT OF IMPROVEMENT may have led some gentlemen, but, I believe, not one yeoman or regular-bred farmer to make experiments in the DRILL-HUSBANDRY, at least not of late years. In the day of Mr. Tull some trials were made of it, but the results were not sufficiently favourable to establish it as a practice.

A singularity in the method of sowing BROADCAST is noticeable, though not peculiarly excellent. The common way is to sow one land or one cast at twice, sowing half the seed ONE way, and (returning on the same land) half the other; the seedsman, in this case, filling his hand at one step, and making his cast at the next. But, in the method under notice, he casts *at every step*, and sows the whole of the seed *at once going over*. This method is more expeditious than the common way; but it requires a steady eye and an expert hand to seed the ground evenly.

23.

W E E D S and V E R M I N.

I. WEEDS. There are, in this District, men who have been singularly observant with respect to the nature of WEEDS; marking their CONTINUANCE, and describing their methods of propagation and *rooting* with *more* than botanical accuracy.

What I principally propose under the present head is to enumerate the SPECIES OF WEEDS most NOXIOUS to the ARABLE LAND of this neighbourhood, and to note what appears to be worthy of notice respecting the different species.

It may be proper to say, that in arranging the species I have *endeavoured* to place them according to their DEGREES OF NOXIOUSNESS; whether it arise from their respective qualities, or from the quantity which prevails *in the neighbourhood of Pickering*. The GRASSES
and.

and the *shrubs* are purposely kept separate, to shew with greater perspicuity their several degrees of hurtfulness to the arable lands of the District under observation.

Provincial names. Linnean names. English names.*

Common thistle,—*ferratula* † *arvensis*,—
corn-thistle.

Docken,—*rumex crispus*,—curled dock.

Nettle,—*urtica dioica*,—common stinging-nettle.

Swine thistle,—*sonchus oleraceus*,—common
fow-thistle.

A a 2

Runsh,

* Taken principally from the catalogue of plants cultivated in the London Botanic Garden, by Mr. CURTIS, author of *Flora Londinensis*; with, however, such alterations as appear to me suitable to the subject of the present volumes.

† Let no voluminous writer pretend to perfect accuracy. Linneus, whose system is a wonderful exertion of the human mind with respect to accuracy of arrangement, appears to have made an evident mistake in the classification of this common plant. How he could be induced to tear it from its *natural* family *CARDUUS*, and force it into that of *ferratula*, may now be difficult to be ascertained. I retain the name,—but protest against the propriety of it. The LINNEAN NAMES are now gone forth throughout all nations; and whoever changes them is speaking a language unknown to UNIVERSAL BOTANY.

Provincial names. Linnean names. English names.

Runsh,—*sinapis arvensis*,—wild mustard.

Runsh,—*raphanus raphanistrum*,—wild radish.

Runsh,—*brassica rapus*,—wild rape.

Dea-nettle,—*galeopsis tetrahit*,—wild hemp.

Hairough,—*galium aparine*,—cleavers.

Groundfil,—*senecio vulgaris*,—groundsel.

Chicken-weed,—*alsine media*,—chickweed.

Dog-finkle,—*anthemis cotula*,—maithe-weed.

Dog-finkle,—*anthemis arvensis*,—corn-camomile.

Cuprose,—*papaver rhoeas*,—round smooth-headed poppy.

Cuprose,—*papaver dubium*,—long smooth-headed poppy.

Bur-thistle,—*carduus lanceolatus*,—spear-thistle.

Red-thistle,—*carduus palustris*,—marsh-thistle.

Swine-thistle,—*senecbus arvensis*,—corn fow-thistle.

Crowfoot,—*ranunculus repens*,—creeping crowfoot.

Foal-foot,—*tussilago farfara*,—colt's-foot.
potentilla anserina,—silver-weed.

Fat-hen,—*chamæpodium album*,—common goose-foot.

Fat-

Provincial names. Linnean names. English names.

Fat-hen,—*chenopodium viride*,—red jointed
goose-foot.

Popple,—*agrostemma githago*,—cockle.

Stoney-hard,—*lithospermum arvense*,—corn
gromwell.

Corn-bind,—*polygonum convolvulus*,—climb-
ing buckwheat.

Sour-docken, — *rumex acetosa*, — common
forrel.

Sour-docken, — *rumex acetocella*, — sheep's
forrel.

Great horseknobs, — *centaurea scabiosa*,—
corn knobweed.

Great blue-caps,—*scabiosa arvensis*,—corn
scabious.

Cushia,—*heracleum sphondylium*,—cow par-
nep.

chrysanthemum segetum,—corn marigold,

Yer-nuts,—*bunium bulbocastanum*,—earth,
or pig nut.

daucus carota,—wild carrot.

centaurea cyanus,—blue-bottle.

trifolium melilotus officinalis,—melilot.

trifolium alpestre,—alpine clover.

Docken,—*rumex obtusifolia*,—broad-leaved
dock.

Provincial names. Linnean names. English names.

Docken,—*rumex sanguineus*,—bloody dock.

carduus nutans,—nodding thistle.

carduus eriophorus,—woolly headed
thistle.

thlaspi campestre,—corn mithridate.

lapsana communis,—nipplewort.

polygnum persicaria,—mild persicaria.

polygnum aviculare,—hogweed.

mentha arvensis,—corn mint.

chrysanthemum leucanthemum,—ox-eye
daisey.

ranunculus arvensis,—corn crowfoot.

ranunculus acris,—common crowfoot.

cucubalus behen,—bladder campion.

Cornbind, — *convolvulus arvensis*, — corn
convolvulus.

achillea millefolium,—milfoil.

Saxifrage, — *peucedanum silaus*, — meadow
saxifrage.

lycopsis arvensis,—corn buglos.

Bur-docken,—*arctium lappa*,—burdock.

antirrhinum linaria,—common snap-
dragon.

valeriana locusta,—corn valerian.

reseda luteola,—dyer's weed.

Brakens,

Provincial names. Linnean names. English names.

Brakens,—*pteris aquilina*,—fern, or brakes.

Crake-needle, — *scandix pecten Veneris*, — shepherd's needle.

veronica hederifolia, — ivy - leaved speedwell.

cerastium vulgatum,—common mouse-ear.

fumaria officinalis,—common fumitory.

euphorbia helioscopia,—sun spurge.

anagallis arvensis,—pimpernel.

flago germanica,—common cudweed.

euphrasia odontites,—red eyebright.

hypochaeris radicata, — long - rooted hawkweed.

myosotis scorpioides,—scorpion mouse-ear.

viola tricolor,—common pansie.

prunella vulgaris,—self-heal.

Quicks,—*triticum repens*,—couch grass.

festuca duriuscula,—hard fescue-grass.

White grass,—*holcus mollis*,—couchy soft-grass.

avena elatior,—tall oat-grass.

agrestis alba,—white bent.

alopecurus agrestis,—field foxtail grass.

Provincial names. Linnean names. English names,

Droke,—*lolium temulentum*,—darnel.

dactylis glomerata,—orchard-grass.

White grass,—*holcus lanatus*,—meadow soft-grass.

Ash,—*fraxinus excelsior*,—ash.

Aspen,—*populus tremula*,—trembling poplar.

White-thorn,—*cratægus oxyacantha*,—hawthorn.

Black-thorn,—*prunus spinosa*,—floe-thorn.

Briar,—*rubus fruticosus*,—common bramble,
rubus cæsius,—dwarf bramble.

Cat-whin,—*rosa spinosissima*,—burnet-rose.

Rust-burn,—*ononis arvensis spinosa*,—thorny rest-harrow.

Rust-burn,—*ononis repens*,—trailing rest-harrow.

It will perhaps be expected, that beside some account of the NATURAL GROWTH of the more noxious weeds, the METHOD OF DESTROYING them will here be mentioned. It is my intention, in this place, to *make a beginning* upon a subject which, to treat of it fully, would itself fill a separate volume.

There

There are two ways of extirpating weeds from ARABLE LAND: by *fallowing* and by *weeding*.

By the term FALLOWING is meant repeated plowings, harrowings, &c. between the crops; whether these plowings, &c. be given in two or in twelve months.

There are several species of weeds which cannot be overcome without fallowing. Weeds which propagate their species by SUCKERS FROM THE ROOT are invigorated by a *single plowing*, which, by giving a fresh supply of air and openness to the soil, gives freedom to the suckers; while the mere feed-weeds being destroyed in the operation, the suckers are left in full possession of the soil: and whoever attempts to lessen the number of such weeds with the *hoe*, is unacquainted with the practice of husbandry.

The CONTINUANCE of a fallow, and the number of plowings requisite, depend on the season, and on the number and the nature of the weeds to be destroyed. If the spring season be found insufficient to effectuate the purgation,—take the summer, and even the autumn, the winter, and the ensuing spring, rather

rather than *crop* an *under-worked fallow*, which is but little superior to a single plowing. One stirring towards the close is frequently more valuable than two or three plowings at the outset. To begin a fallow without continuing it until its *intention be fully accomplished*, is throwing away labour unprofitably.

By WEEDING is meant the act of destroying or checking weeds while the crop is growing, to prevent their preying upon the soil, and propagating their species by seeding; whether the operation be performed with the *boe*, the *spadle*, the *hook*, or the *hand* alone.

Next to the plow and harrow, the HOE is the most destructive to *seed weeds*; but the hoe ought not in any case to be relied on: the HAND alone ought to give the *finish* to weeding: and the *later* this is given, so that the crop be not materially injured by the operation, the more valuable will be its effect.

The *close* of this operation is similar to that of the fallow. One *additional* weeding is given at a small expence; and without it, perhaps, those which preceded were of little benefit.

benefit. One weed left to spread its seeds this year may be the cause of an hundred the next.

COMMON CORN THISTLE. Nature has been singularly attentive to the preservation of this species of plant. Its seeds have wings, and its roots are worm-like; diffusing themselves on every side, and striking to an unlimited depth, sending out suckers from their joints; while the plant itself is armed at all points to guard its existence until its seeds are *impregnated*. The fecundation having taken place, the plant may the next day be trodden down or torn up by the roots, without hindering the maturation of the seed: the succulency of the stem itself being sufficient to *mature* the seed without further assistance from the soil.

A plant thus favoured has probably some valuable quality belonging to it. Be this as it may, viewed as a weed to corn, it is the most dangerous enemy the arable farmer has to deal with.

Neither FALLOWING alone, nor WEEDING alone, will prevent its mischief: their joint efforts are necessary to keep it within bounds:

to work its total extirpation from a soil it affects, is scarcely possible. Nevertheless, it ought to be the ambition of every farmer to approach as nearly as he can to this first thing desirable with respect to weeds; for, in endeavouring to overcome this, less powerful enemies will fall imperceptibly.

COUCHGRASS. This plant, viewed botanically, is of the same genus as **WHEAT**: forming its parts of fructification in the same manner; and, what is noticeable, its roots contain a milky juice resembling in taste the milky grains of unripe wheat.

But nutritious as these roots undoubtedly are, and valuable as their dietetic and medical properties may be, they are frequently ranked as the first, and may properly be considered as the second, enemy of the arable farmer.

As a worm-rooted plant, the couch-grass is certainly entitled to precedency among the weeds of corn; but its seeds have not wings; nor do they scarcely ever reach maturity in *arable* lands.

Its method of propagation, there, is entirely by roots; which, in a loose rich soil, will

will diffuse themselves to an unlimited distance. Every *joint of the root* is in effect a *seed*, which only requires air and openness of soil to fit it for vegetation, and enable it to send forth fresh roots; and consequently to furnish the soil with a fresh supply of *seeds*.

The nature of couch-grass, and its method of propagation, being duly considered, the method of destroying it evidently appears.

To free the soil from the seeds of weeds which are lodged in it, we endeavour to place them in a situation favourable to vegetation; and, as soon as they have vegetated, to destroy the seedling plants while yet in a tender state; thus converting the seeds into a melioration of the soil.

The same principles of management are applicable to the roots of couch-grass. Break up the soil in such a manner as to give it the greatest surface, in order to encourage in the amplest manner possible the vegetation of the roots. As soon as this is effected, endeavour to destroy the young suckers while they are yet in a delicate tender state, before they have had time to establish themselves, or to send out *fresh roots* for the purpose of propagation.

In

In destroying the first crop of suckers, a second exposure of roots takes place; and to render the exposure as ample as possible, the greatest quantity of surface should still be preserved.

Hence it follows that the PLOW is the fittest implement for the destruction of couch.

The *harrow* destroys the requisite ROUGHNESS and OPENNESS of the soil, and lessens the desirable QUANTITY OF SURFACE. The common practice of harrowing out live roots, and burning them, or carrying them off, is an evident impropriety; incurring a waste of labour, and an impoverishment of the soil.

To attempt to destroy couch-grass with the *Loe*, or any other implement of weeding, implies ignorance or folly in the extreme.

I speak not here from theory, or from the opinion of others, but from my own experience and observation in different Districts of the kingdom.

Docks. The growth of this genus of plants is different from that of either of the foregoing. It matures its seeds quickly, and in great abundance; but they have no wings to scatter them at a distance; they fall at the
 foot

foot of the plant. This renders a creeping root unnecessary. Nature's chief care seems to have been to establish the parent plant firmly in the soil, and to guard against its destruction.

To this end it is furnished with a very strong perennial taproot of singular properties. If divided below the crown, the part left in the ground sends forth sapling shoots; and this from almost any depth; provided it have head-room, or the soil be loose. The upper part too, if cut off a few inches deep, will survive the amputation. Even when inverted with the plow, it will recoil, and find its way to the surface again.

In this case, therefore, the *plow alone* is an improper implement of destruction. On the contrary, it may, and frequently does, increase the number of plants; the part cut off, and the part left below the plow, both of them surviving the separation.

Hence it is evident, that land which is infected with docks should be gone over with the DRAWING IRON or the SPADE some time before the PLOW be put into it; that the tops may be removed, and the rootlets left in
the

the ground may have time to rot before the land be plowed.

With this precaution, and with a person to follow the plow with a spadlet to grub up the bottoms, and to disengage the tops of such as may have escaped the previous weeding, the *roots* of docks may with great certainty be got rid of.

The *seeds* of docks are to be destroyed in the same manner as those of other weeds; namely, with the plow, the harrow, and the roller: with this difference, however, that in destroying the seedlings of the docks, or any other *strong-rooted perennial plant*, the intervals between the plowings should be *short*: for if they once get themselves *established in the soil*, it is, without a favourable season, out of the power of TILLAGE to extirpate them.

Another precaution with respect to the seeds of docks is necessary: they are sometimes *sown* upon the land with *corn*, and very frequently with *clover*.

From CORN and PULSE they may be separated with the skreen, and still more effectually with the sieve; and no man can, in common prudence, sow any species of these un-
til

til the feeds of weeds have been separated with the utmost care.

But from CLOVER SEED, the feeds of docks cannot easily be separated : they are nearly of the same *size* and the same *weight* ; neither the sieve nor the fan can part them. Singular caution, therefore, ought to be had in the purchasing of this seed.

If every man would be cautious in this matter, the grower of that article would be assiduous in weeding their seed clover from this pernicious and disgraceful weed. To suffer *one* dock which has matured its seed to be *thrashed* with seed-clover is a crime which ought, among farmers, to be deemed unpardonable.

CLEAVERS. “ Hairough” is here considered as one of the worst weeds which WHEAT can be infested with ; not more from the method of its growth than from the evil effects of its feeds, which are allied to the grains of wheat, as the feeds of the dock are to those of clover. They are very difficult to separate ; and when ground with wheat, are hurtful to the flour.

The hairough is an *annual plant*, having a singularly *feeble root*, easily to be destroyed.

When this weed has been thick upon the ground, and by its climbing nature has gained the ascendancy of the corn, I have known it dragged out with IRON-TOOTHED RAKES with good effect and quick dispatch. In vacancies, and while the corn is low, a small HOE may be used; but in general it is best to draw it with the HAND alone.

The *seeds* of the cleaver, like those of most annual plants, will lie in the soil for ages, without losing their vegetative quality. But by FALLOWING, provided the season be favourable to their vegetation, they may be easily extinguished.

WILD MUSTARD. With this may be classed all other *annual weeds*, whose seeds are *small* enough or *light* enough to be separated easily from the grain among which they grow. The *stems* of most of them will send forth fresh shoots if cut off *above the crown*; but if taken off *below the crown*, the *root and stem* are at once destroyed.

FALLOWING and WEEDING are therefore in this case equally effective. Those
which

which escape the *plow* ought to be cut off with the *hoe*; and what the *hoe* misses, the *hand* ought to eradicate.

But it is always better to prevent than to destroy weeds; which if they live but a day, do more or less injury to the infant crop.

The extinction of the *seeds*, before the crop be sown, is one of the FIRST OBJECTS of the ARABLE FARMER. This is to be effected by FALLOWING; and by FALLOWING only.

In treating of the *roots* of couch-grass, an ampleness, and consequently a ROUGHNESS OF SURFACE was recommended. The principles there laid down are applicable to the dissolution of *seeds*.

Nature has wisely ordered, that the smaller seeds of vegetables shall not vegetate at a distance from the surface; consequently in a soil fraught with the seeds of weeds, the QUANTITY OF VEGETATION will be in proportion to the QUANTITY OF SURFACE.

The ROUGH FURROWS of the *first* plowing of a fowl fallow, and the ROUGH CLOUDS of the *second*, will, in a moist season, be set round; so far as their surfaces are free and open to the air, with seedling and rootling plants. Where-

as, had the surface been *levelled* with the harrow immediately after the plowing, more than half the quantity of surface would have been done away; and of course more than half the quantity of vegetation prevented.

But the quantity of surface is far from constituting the only advantage of a ROUGH CLODDY FALLOW.

If the season be *dry*, the sun and dry air having free admission on almost every side of the prominent clods, the *roots* of the plants contained in them become parched up, destitute of pasturage.

If the season be *moist*, the seeds of weeds vegetate, *while the clods are continually mouldering*; thus at once destroying the seedlings already excluded, and baring *another surface* for a *fresh* vegetation.

When the clods are so far reduced that the PLOW is no longer able to prevent their being buried among the loose mould, it is *then* the business of the HARROW to pull them up to the surface.

When the plow, a pair of rough harrows, and the atmosphere have done their part toward the reduction of the clods, the assistance
of

of the ROLLER and finer harrows should be called in. Not a root should be left unloofened, nor a feed unlocked.

When the feeds near the surface have burft, another exposure should be made : not by a *flat plowing*, but by raising the foil into narrow ridglets by a *half plowing*; thus increasing, perhaps doubly, the quantity of surface.

As the feeds burft and the remaining roots wither, harrow down the ridglets, and thereby expose fresh victims to the atmosphere.

Reverse the ridglets, and repeat the harrowing.

If a foil be *very foul*, either with the ROOTS or the SEEDS of weeds, it is in vain to think of making it *sufficiently clean* with less than FIVE OR SIX PLOWINGS : seven or eight may, in some cases and in some seasons, be necessary.

SPEAR THISTLE. This and a numerous tribe of *biennial weeds* are more injurious to *grafs* than to *corn*; which however is too frequently injured by them.

The nature of this class of plants is to form their root-leaves the *first* year, and to run up to feed the *second*. The feed matured, the root dies.

Their ROOT-LEAVES, by spreading upon the surface and feeding in the soil, are injurious to corn; and among early-sown WHEAT the plants may get sufficiently strong in autumn, to run up to seed the ensuing summer. Also corn sown on *one plowing* may be injured by this class of weeds surviving the operation and rising between the furrows.

The best implement for destroying the biennial thistles is the SPADLE, or a small HOE, taking off the crown of the root somewhat within the surface of the ground. The root perishes, and the extirpation is of course final.

CORN SCABIOUS, CORN KNOBWEED, MIL-FOIL, and other *strong-rooted perennial weeds*, may be ranked among the most hardy enemies of arable crops.

A dock may in proper season be drawn: its root is taper, brittle, and runs to a definite depth. But the roots of the plants under notice are, at some seasons, as tough as leather, running, in a rope-like cylindrical shape, to almost any depth. To draw them, when they are fully established in the soil, is impossible; and if they be broken off or cut
within

within the surface, they send forth sapling shoots, even from the bottom of the plow furrow, when cut off with the share, and *buried* six or eight inches deep with mould!

The only probable means of extirpating these weeds from arable land, is to FOLLOW THE PLOW with a long narrow spade or other LONG SHARP IMPLEMENT, fetching up the root as deep as possible, filling up the hole with mould, and treading it down hard with the heel, effectually to prevent the saplings from rising.

CREEPING CROWFOOT, CREEPING BENT, SILVER WEED, and other *creeping perennial weeds*, form another class of troublesome enemies to corn land. The first and last send out *creepers* (like the strawberry) for the sole purpose of extending their dominion and increasing their species. The second sends out rootlets from the joints of its *stem*, which, being feeble, falls to the ground as its length is extended and the weight of its top is increased. The parent roots of both are fibrous and easily destroyed.

If, therefore, these weeds be taken in time, they are readily extirpated by WEEDING;

but when once they have bound themselves to the surface with innumerable ligatures, **FALLOWING** is the only means of destruction. In this case it is observable, that the *barrow* may be used in the first stages of the fallow with propriety (thereby shortening its continuance), provided no other root-weeds are to be at the same time destroyed. *Skimming the surface* with the plow, the horse-hoe, or the paring-spade, is more effectual against these weeds than *deep plowing*.

TREES AND SHRUBS. These are doubly injurious to corn : in occupying the soil, and in forming obstructions to the plow and harrow. Those which throw up suckers are also burthensome to the crop.

If the **ASH**, the **ASP**, or the fine-leaved **ELM** abound in hedges,—either the adjoining inclosures should be kept in grass, or, previous to their being plowed up, *the surface-roots should be cut off* by a trench dug at a suitable distance from the hedge, tracing the larger roots, and filling up the trench. When the smaller roots are rotten, break up; and as often as a fresh stock of roots become troublesome, repeat the operation.

But

But even with this precaution their injuriousness will only be lessened, not wholly prevented. A total eradication, let their state of growth be what it may, is in general to be preferred. How imprudent then to plant shallow-rooting trees in the hedges of inclosures, whose soil or situation requires that they shall be broken up for corn before the timber reach sufficient maturity.

II. VERMIN. The different species of vermin which have more particularly excited notice in this District are,

1. Mice.
2. Rats.
3. Dogs.

1. MICE. The mouse rivals the sparrow in mischievousness toward the farmer. In the field, the barn, and the dairy, mice are equally troublesome and destructive. In the field, the quantity of destruction is not easily to be ascertained; but it is probably much greater

greater than the unobservant are aware of. At feed-time and at harvest they not only feed freely upon corn, but fill their granaries with it as a resource in less plentiful seasons. Much care is bestowed on the destruction of moles; and it might be worth while to endeavour to lessen the number of field-mice, which, I am of opinion, are in their nature more injurious to the farmer than moles are.

In the rick-yard, the barn, the dwelling-house, the garden, and the nursery-ground, their mischievousness is too obvious to be overlooked; and the utility of lessening their number in these places is too well known to require an enumeration of facts to prove it.

The method of destroying mice is a subject not unworthy the attention of any man who is interested in rural affairs. If some art or some natural enemies were not employed in lessening their number, the entire supply of human food would not be sufficient to support them. Even in their present state, I have heard it intimated by a man whose observations are frequently just, that it is a disputable

putable point whether the mouse or the tithe-man is a greater enemy to the farmer*.

The barn and the stackyard are usually put under the care of the cat : to set a mouse-trap in a barn full of corn has perhaps been considered as a thing so unlikely to be effective, that it has seldom been tried : I have never met with an instance of it, excepting one in this District, in which its success has been extraordinary. A barn, which for many years had been remarkably infested with mice (notwithstanding a numerous guard of cats), has, by a proper use of traps, been kept in a manner wholly free from them.

It having been observed, during long experience, that these mischievous animals, uncontented with their destruction among the corn,—attacked leather, grease, or other animal food, which happened to be left in the barn,—traps were set in their runs and natural

* This idea, however, is more applicable in a grass-land country, where corn, being less in quantity, is more liable to be destroyed by mice, than it is in an arable country, where the proportion of corn is greater ;—where the barn is oftener emptied ;—and where pillar stack-frames and pillar granaries are generally more in use.

tural hiding-places, and baited with these substances. The success was every thing to be desired; for although a total extirpation has not taken place, an annual saving of some quarters of corn has been the consequence.

Under an idea that it was a CHANGE OF FOOD which in the barn constituted the *bait*, the same principle was applied in the cheese-chamber, and with the same success. Here, traps baited with corn were taken with avidity.

In the garden it was observed, that much depended on the season of the year: therefore, here, natural hiding-places were sought for; and if convenient ones could not be found, artificial ones were made, in different parts of the garden, with logs, stones set hollow on-edge, boards, &c. In these hiding-places a variety of food is laid for several days, whenever mice become troublesome; and whatever food is preferred, with that traps are baited.

By these means the entire premises have been kept in a manner wholly free from mice.

While

While the number is great, almost any kind of trap may be used, provided it be properly baited: for taking a remaining artful few, a common-shaped round steel-trap, adapted to the size of the mouse, has been found to be the most effectual.

2. RATS. This animal, equally artful and mischievous, is difficult to be taken by stratagem. In farm-homesteads situated near water, it is become almost impossible to keep down their numbers. In every country they are a growing evil, not only in Rural Economy, but in manufacture and in domestic life. Should their numbers continue to increase with the same rapidity they have done since the present breed got footing in the island, they will in no great length of time become a serious calamity. They are perhaps at present an object of national attention. A simple and certain method of destroying them would indisputably be a public good of no small magnitude; and the nation's purse might be worse employed than in giving a reward for so desirable a discovery. Some years ago the French government offered a premium for a speedy and effectual
method

method of destroying ants in one of their West-India Islands, and it had the desired effect.

3. Dogs. It is not through an antipathy to dogs that I class them here among vermin: I am led to it by facts, which, though not extraordinary, ought to be known.

A few years ago the whole country was alarmed with the apprehension of CANINE MADNESS. A considerable proportion of the dogs kept in it were actually mad. Much live stock and several persons were bitten. Fortunately, however, thus far none of *these* have been attacked by that horrid disorder; but they still live under the dreadful apprehension of their being every day liable to be seized by the greatest calamity human nature is liable to*.

In

* Since writing the above no less than seven persons were, in this place, bitten by one dog! Much live stock has also lately been bitten. In a neighbouring village a calf which had been bitten was seized with madness, and bit the person who had the care of it.

What aggravates the first-mentioned instance is, that the person to whom the dog belonged knew that he had been bitten a few weeks before, yet suffered him to go loose,

In the course of last winter (1786-7) the value of SHEEP WORRIED BY DOGS, in this township alone, was calculated at near one hundred pounds. A small farmer whose entire flock did not amount to more than forty, had thirteen sheep and eleven lambs worried in one night.

These are not mentioned as singular facts : every District and almost every year afford instances of a similar nature ; nor do I mention them to excite a momentary indignation in the breast of the reader ; but in hopes that they may be instrumental in rousing the humanity of those who have it in their power to mitigate the danger, and lessen the quantity of evil.

The

loose though urged to the contrary. Surely, on culprits like this, some severe penalty or some severe punishment ought to be inflictible. A general law against every man whose dog is suffered to stray in a state of madness, might have a good effect.

If the practice of *sworming* be really effectual in preventing the mischiefs of canine madness, a severe penalty is due from every owner of a dog which has not undergone so salutary an operation.

Several instances are related of persons to whom canine madness has proved fatal in this neighbourhood. And the instances of live stock which have suffered by the same means are innumerable,

The quantity of human food which is annually wasted on *useless* dogs is itself an object of national attention. When the horrors of canine madness, the wanton torture of innocence, and the wanton destruction of one of the first necessaries of life are added, the object becomes of the first concern to the nation. Who, even in these days of Public Economy, would think ten thousand pounds a-year ill bestowed in doing away such an accumulation of public evil? Yet who does not know that in doing it away ten times ten thousand a-year might be drawn into the national treasury! Let not the patriotism of Princes, the ability of Ministers, nor the wisdom of Parliament, be spoken of in this country, until a NATIONAL ABSURDITY so glaringly obvious be removed.

There are men whom *friendship* inclines to the cause of the dog. Far be it from me to damp the flame of friendship. But is not the lamb equally, at least, entitled to our friendship? Who sees the little innocent dragged to the slaughter without regret; and who, without

out

out remorse, could see one lie mangled in the field, half alive, half eaten up, by the merciless, yet *befriended* dog*?

But the operation of a tax upon dogs would probably be different to what is generally conceived. I am of opinion, that were such a tax to be laid on judiciously, the immediate destruction of dogs would be inconsiderable. The tie of affection must be weak which a shilling a year would dissolve: even the poor-man's dog would die a natural death under those easy circumstances.—But what poor-man would think of paying even a shilling a year for a dirty troublesome puppy for which he had not yet conceived any particular affection? Thus the number of dogs would annually and imperceptibly decrease.

In six or seven years the tax would require an advance: its productiveness would be lessened, and the rearing of another class of

* In the massacre above-mentioned, the *friend* of a man, whose situation in life ought to direct him to be the guardian of peace and good-order, was principally concerned: not once, but repeatedly. Any man who knowingly suffers his dog to worry a second time, deserves himself to be subjected to *that* which his dog is liable to for the first offence.

dogs would require *prevention*. In a few years more it might receive its final advance.

The productiveness of the tax ought not to be considered as the primary object of a tax upon dogs. The removal of the public evils which have been enumerated should be at least jointly considered. Five shillings a head would reduce the number of dogs; and would, perhaps, be found on experience to be more productive than a lower tax.

Dogs *necessary* in husbandry, manufactures, &c. and hounds *kept in kennel* ought, perhaps, to be exempted from the tax.

HARVESTING.

24.

H A R V E S T I N G.

NO DEPARTMENT of rural economy distinguishes the NORTHERN from the MIDLAND and SOUTHERN parts of the Island so much as the method of Harvesting. And, perhaps, no Northern District is more strongly marked with this distinguishing characteristic than that which is now under survey.

1. Cutting corn with the sickle.
2. Cutting corn with the fith.

I. SICKLE. It is probable that nine-tenths of the corn which is cut with the sickle in *this* kingdom is cut by *men*. In Surrey and Kent a woman may sometimes be seen with a sickle in her hand. In Norfolk it is a sight which is seldom or ever seen. Here, it is almost equally rare to see a sickle in the hand of a man; reaping — provincially, “shearing,” — being almost entirely done by WOMEN.

Three women and one man make a fett; who, of a middling crop, do an acre a day. If corn be thin, a man will bind after four women; if very thick upon the ground, he requires a boy to make bands for him.

Sometimes the bands are laid for the women to throw their handfuls into; but in general they lay the corn in "reaps," of about half a sheaf each; the binder gathering it up carefully against his legs in the manner wheat straw is usually gathered on the thrashing-floor. This is much the best way (though somewhat more troublesome); the corn being by this means bound up tight and even, and the sheaves made of an equal size.

The day-wages of a woman in harvest is 10d. of a man 2s. Thus wheat, which in Surrey would cost 10s. to 12s. and which, in any country I have observed in, would cost 7s. or 8s. is here cut for 4s. 6d. an acre.

But the saving of so much an acre is far from being the only advantage arising from the practice of employing women in the work of harvest. The number of hands is increased; the poor-man's income is raised; the parish-rates are in consequence lessened; and

and the community at large are benefited by the diffusion of a habit of industry, and an acquisition of health. How conducive to this are the employments of husbandry compared with those of manufacture! And the work of Harvest, so far from being thought a hardship, is, by women who have been bred to it, considered as a relaxation to domestic confinement, and less agreeable employments.

Wheat and *rye* are set up in shocks,—provincially “stooks,”—of twelve or ten sheaves each; two of which are invariably used as “hood-sheaves” for hooding, capping, or covering the heads of the rest. Twelve sheaves are termed a “stook;” in which wheat formerly was generally set up; but unless the straw be long, two sheaves are not equal to the safe covering of ten. It is therefore now the more general practice to set them up in “tens;” by which means they are much more effectually covered.

In the south of England the covering of wheat is never practised: here wheat is never left a day uncovered. Both practices are wrong. In fine weather the ears of corn can-

not be too much exposed to the sun and dews; if the grain be thin, even a slight shower is of great benefit to it. In a rainy season they cannot be covered too closely. Therefore, in the covering of wheat, as in almost many other departments of husbandry, the farmer ought to be directed by the season; not by the general custom of the country he farms in.

II. SITHÉ. In the southern and midland provinces, corn is invariably *mown outward*, and dried in *swath*. Here, it is as invariably *mown against the standing corn*, and dried in *sheaf*.

The method of sheafing varies. Upon the Wolds the prevailing method is to bind the sheaves in the usual banding place, and to set them up in "stooks." This is termed "binding;"—a practice which appears to be growing in the Vale.

But formerly, the invariable practice was, and the prevailing practice still is, here, to tie them near the top, and set them up in *single sheaves*,—provincially, "gaits."—This is called "gaiting;" which, if the corn be weedy,

weedy, or full of cultivated grass at the bottom, is a most admirable practice.

In MOWING corn for sheafing, a cradle of three points (similar to that of two points used in Kent, and in mowing corn into swath) is generally placed over the fithe, to collect the corn, and assist in setting it up straight, but somewhat leaning, against the standing corn. If corn stand fair, a man who knows how to set his cradle, and use his fithe, will set it up with great evenness and regularity. If corn be somewhat disordered, yet mowable, a bow (similar to that used in most countries for mowing corn outward) is affixt to the fithe for the same purpose.

The mower is followed by a woman, who makes bands, and “lays out” the corn into sheaf. This she does either with the hands alone, or with a short-headed, long-toothed wooden rake: gathering the corn with the rake; and, when a sheaf is collected, throwing it dextrously into the band with her foot; without touching it with her hands; and, consequently, without the inconveniency of stooping. If the crop be large, the woman

has generally a boy to make bands for her.

A man, or a stout boy, follows to tie and set up the sheaves; or if the crop be thin, one man binds after two fithes.

IN SETTING UP SINGLETS properly and expeditiously, there is an art and dexterity requisite which can only be learnt from practice. The band being loosely tied at about the same distance from the head of the sheaf, as it usually is from the butts,—the binder lays hold of the ears with both hands immediately above the band; striking the sheaf down pretty hard upon its butts, in order to give it a flat even base. One hand (the right for instance) is then loosened, and inserted edge-way into the middle of the butts. The body, with the arms in that posture, is thrown forward, and brought round with a sweep to the right; thereby spreading the butts of the right-hand side of the sheaf. The situation of the hands is then changed: the right is placed upon the ears, the left within the sheaf, bringing them round with a sweep to the left, leaving the sheaf a *hollow cone*.

If the face in this operation be turned toward the north, and, in the last sweep, an opening or door-way be left to the south, the rays of the sun will have admision to keep the ground dry within, and assist the wind in drying the inner side of the sheaf.

These particulars may, on paper, appear tedious; but, in practice, an expert hand will go through them in a few seconds of time.

There is, however, a much readier way of setting up single sheaves; namely, by lifting them as high as the arms will conveniently reach; and bringing them smartly to the ground with a jerking motion, which spreads the butts; but does not give the desirable *bollowness*; nor the *firmness* which is requisite in windy weather.

When the singlets are dry enough for carrying, they are "bound," in the usual banding place.

In BINDING, the band is laid upon the ground, about a foot from the skirts of the singlet; which is pulled over into it, and bound in the common manner. The original
band

band of the first sheaf is pulled off for the second ; so that, without an accident, the first band only requires to be made at the time of binding. This renders the operation less tedious than theory may suggest.

The sheaves, when bound, are collected into heaps, and carried on the day of binding ; or are set up in shocks, as accidents or convenience may require.

If the corn be “ *bound* ” at the time of mowing, it is set up in shocks ; in which it stands until it be fit for carrying.

This is less troublesome than first “ gaiting ” and afterwards “ binding ” it. And if the corn be ripe, and the bottom be tolerably free from weeds, &c. it is, perhaps, the more eligible method, for corn which is cut with the SITHE.

But for under-ripe, or weedy corn, though cut with the SITHE ; and for all *oats* and *barley* which are cut with the SICKLE ; “ gaiting ” is here considered as essentially necessary. Corn cut with the SICKLE lies straighter and closer in the band than mown corn ; which being more or less ruffled with the SITHE or the rake, does not bed so closely in the band ; the air
thereby

thereby gaining a more free admission into the center of the sheaf.

If *barley* be short upon the ground, free from weeds, and well-headed (especially the four-rowed barley or "big"), it is difficult to be "gaited;" the heads of the sheaves being too bulky, and the butts not sufficiently so to form a basis broad enough to support them. Its slippery nature also renders it difficult to be kept in a loosely tied band. Barley, therefore, is more commonly bound after the fithe than oats are. But when it runs much to straw, and is weedy, or full of grasses at the bottom, gaiting becomes essentially necessary to good management. Barley is more liable than any other grain to take damage in the field; and every means of forwarding its drying, thereby shortening the length of time between the cutting and the carrying, ought to be employed.

Shocks of oats and barley bound after the fithe are generally left uncovered until the time of carrying. If, however, the season be unsettled, and the heads be got pretty well weathered while the butts are yet under-dry,
it

it is well to put on hood-sheaves, and thereby guard the grain from too great an exposure to the weather.

The COMPARATIVE ADVANTAGES of harvesting barley and oats in sheaf are numerous. The waste throughout is less; the corn, especially in gaits, is at once got out of the way of the weather; the labour of carrying, housing or stacking is much lessened; much barn room is saved; the labour of thrashing is less; the straw, if the harvest prove wet, makes much better fodder; and, under this circumstance, the corn preserves its colour in sheaf, incomparably better than it does in swath.

The *apparent inconveniency* of Harvesting corn in sheaf (I mean that which must strike every one who has not duly considered the subject, and compared the nature and the quantity of labour separately requisite to each of the two methods of Harvesting) is the increase of labour at the outset. But if the laying out and the binding be done by women and boys, or by men who cannot mow (which is almost invariably the case) the business of mowing goes on the same pace,

or nearly the same pace, as it would have done had the corn been mown into swath. Besides, the repeated turnings which frequently are requisite, and the cocking which always is necessary, are entirely excluded by binding.

Upon the whole, it is evident, that the quantity of *men's* labour is diminished, not increased, by the practice of Harvesting in sheaf. If to this be added the ease and expedition in the business of carrying (the most important business of harvest, and that which requires the quickest dispatch), we may fairly conclude, that by Harvesting in sheaf, the labour, the anxiety, and the hazard of harvest are lessened; while the quality, and consequently the value of the produce is increased.

My own practice having been in Districts where Harvesting in swath is the universal custom, I had conceived that the practice of Harvesting in sheaf was only adapted to a *country thin of corn*; and that it was altogether impracticable in what is called a CORN COUNTRY. But the WOLDS of this District leave no room for such a conjecture. The
Yorkshire

Yorkshire Wolds are not only a corn country ; but the farms are many of them of extraordinary size : nevertheless, it is the invariable practice of the District to harvest barley and oats in sheaf. One man, a few years ago, grew between three and four thousand quarters of oats and barley ; every bushel of which was harvested in sheaf.

I am too well aware of the difficulty of changing the custom of a country, to recommend to any man who farms in a southern District, to attempt to harvest all his corn in sheaf, without regard to the weather or the state of the season. But I will not hesitate to recommend to every man who has barley or oats to cut in a wet season, or in a late harvest, to harvest them in sheaf.

In Surrey, Kent, and other counties, where mown corn is laid straight in swath, there would be no difficulty in harvesting in sheaf. The corn might be mown outward in the usual manner, and sheaved out of swath ; which is, perhaps, upon the whole, a better method of sheafing than that which has been described as the practice of this District.

The

The great art of laying corn straight with the fithc, whether it be mown inward or outward, is to keep the face somewhat inclined toward the standing corn: thus, in mowing outward, the left hand and the left foot ought to go somewhat foremost: on the contrary, in mowing inward, the right side ought to precede. Much depends upon setting the cradle or the bow; which should be so set as to take the whole of the corn cut at a stroke, without interfering with the standing corn. The fithc, in mowing, ought to be brought well round to the left, as if for the intention of throwing the corn behind the mower. To allow for this length of sweep, the swath should not be taken too wide; nor, in ravelled corn, should the fithc be too long.

By a little practice, *young* men who can handle their fithes, and whose dispositions incline them to oblige, might in any country soon be rendered sufficiently perfect in the art of laying corn straight in swath; or of setting it up straight and evenly against the standing corn. In exercising these, young women might at the same time learn to lay out the sheaves,

sheaves, and stout lads to set them up singly. A leisure opportunity should be embraced: The outset should be considered as a matter of amusement. A few acres this year might be an inducement to extend the practice to a greater number the next. The art once acquired, it would be ready to be applied on a large scale, whenever a wet season, or a backward harvest should happen.

25.

FARM-YARD MANAGEMENT.

I. BARN MANAGEMENT. The subdivisions of this subject which are noticeable here are,

1. Binding the straw.
2. Winnowing the corn.

1. BINDING STRAW. Straw of every kind is bound upon the thrashing-floor. This, when straw is not used at the time of thrashing, would, in any country, be good economy.

Straw

Straw in trusses is much better to move, lies in less room, and retains its flavour longer than loose straw does. In a country where cattle in winter are universally kept in the house and foddered at stated meal times, the binding of straw becomes essential to good management. Each truss — provincially, “fold” — contains an armful (that is, as much as the arms can conveniently *fold*); and this is the usual meal for a pair of cattle. Thus the business of “foddering” is facilitated, and a waste of straw avoided.

2. WINNOWING Under the article IMPLEMENTS, the present practice of winnowing with the “machine-fan” was mentioned. All that remains to be done here is to endeavour to give some general rule for the method of using it.

Practice only can teach the minutiae of the art, which, though here so prevalent, is far from being well understood. The complexity of the machine is such, that labourers in general are ignorant of the means of adjusting it; and let its construction be ever so perfect, much depends on regulating it properly for different kinds of grain, as well as in setting it with truth for any particular species.

The outlines of the art lie in adapting the strength of the wind to a due and regular supply of the given contents of the hopper; and in adjusting the several regulators in such manner as to separate the chaff, the colder, and the grain with the greatest possible exactness.

Wheat is generally run twice through the machine; but with a good machine, properly regulated and deliberately fed, it may be made marketable by running it once through. *Barley* and *oats* are seldom put through more than once. And *beans* or *peas* may be cleaned as fast as a man can supply the hopper with them.

Superior advantages of this species of fan are dispatch, the saving of the labour of one man, and the preservation of the health of those who are employed. The sail-fan,—the common winnowing-fan of the kingdom at large,—requires one person to turn, one to riddle or “heave,” and one to fill the riddle or scuttles; and for this sett seven or eight quarters of wheat is a day’s work. Two persons with a machine-fan, properly set and pro-

properly supplied, will winnow the same quantity in half-a-day. The fan itself supplies the place of the person who riddles; and all the labour which is necessarily bestowed on the difficult work of separating the one continuous heap into corn, chaff, and colder, and running the intermingled parts down again and again to reduce them to one or other of those articles, is entirely saved.

II. YARD MANAGEMENT requires to be subdivided, in this case, into

1. Expenditure of straw.
2. Raising yard-manure.

1. EXPENDITURE OF STRAW. In the Vale and the Morelands cattle are almost universally kept tied up in houses, or hovels, or under sheds, which, if the aspect be good and the ends properly sheltered, are preferable to close houses. Warmth and dryness are no doubt of great advantage to cattle in winter, especially to lean straw-fed cattle, which cannot bear the severity of weather so well as cattle whose keep is higher. But in this, as in most things, there is a medium to be observed. The hair of cattle kept in a

close warm house naturally grows thin, and peels off prematurely ; exposing the cattle when turned out to grafs in the fpring to a degree of unneceffary hardfhip, which, in its effect, is perhaps frequently worfe than exposing them in an open yard in the winter months.

The warmth of the cattle, however, appears to be here only a fecondary object : the SAVING OF FODDER feems to be the principal motive for tying up cattle of every kind in winter ; by which means almoft every ftraw is eaten ; the cattle frequently lying, without litter, upon the bare floor of their ftalls. Twenty or thirty head of cattle are here kept on the fame quantity of ftraw, which in moft corn countries is allowed to be picked over by eight or ten.

The dung drops into a fquare trench, which is cleaned every day, while the cattle are out at water, or in the fields at grafs.

Bound cattle are ufually foddered four times a day : in the morning ; again in the forenoon ; a third time when they are taken up from watering ; and finally, in the evening. The beft of the ftraw is given to the
young

young stock, the inferior sort to oxen. Cows are chiefly kept on hay, even when they are dry of milk ; an evident impropriety, especially when applied to the short-horned breed of cows, which generally calve with difficulty.

On a general view it is evident, that the expenditure of straw in this country is adapted to its climate, and to its state of husbandry. Where grassland abounds, cattle of course are numerous, and straw proportionally scarce. On the contrary, in a cornland country straw is more plentiful than stock ; and all that is there thought of is to get it *trodden* into manure.

2. RAISING YARD MANURE. It would be foreign to the present work to canvass the propriety of *treading* straw into manure. This country has generally stock enough to *eat* every straw it produces ; therefore to *tread* it to manure and to *waste* it are here synonymous expressions. It is here all wanted as fodder, and it would be an evident absurdity to litter the yard with it. All I propose at present on this subject is, to recommend to my countrymen a more economical management of the

little yard-manure they make,—let its quality be what it may.

The general practice at present is to pile it on the highest part of the yard; or, which is still less judicious, to let it lie scattered about on the side of a slope, as it were for the purpose of dissipating its virtues.

The urine which does not mix with the dung is almost invariably led off the nearest way to the common-shore, as if it were thought a nuisance to the premises. That which mixes with the dung is of course carried to the “midden,” and assists in the general dissipation.

A yard of *dung*, nine-tenths of which is straw, will discharge even in dry weather some of its more fluid particles; and in rainy weather is, notwithstanding the straw, liable to be washed away if exposed on a rising ground.

But how much more liable to waste is a mixture of dung and urine, with barely a sufficiency of straw to keep it together in a body? In dry weather, the natural oozing is considerable; and in a wet season, every shower of rain washes it away in quantity. It
may

may be a moot point whether, in some cases, half the essential virtues of the dung as a manure may not be lost by improper management. Certain it is, that in all cases much too great a proportion is lost ; and it behoves the husbandmen of this District, and of every District where the housing of cattle in winter is practised, to pay particular attention to the management of Farm-yard-manure.

If a small proportion of the expence and attention which has of late years been so well bestowed on the making of DRINKING-POOLS were to be applied to the forming of DUNG-YARDS, the profits, great as they are in one case, would, I am persuaded, be found still greater in the other.

The Norfolk method of BOTTOMING the dung-yard with mould is here indispensably necessary to common good management. There is no better manure for GRASSLAND than mould saturated with the ooziings of a dunghill : it gets down quicker among the grass, and has generally a more visible effect than the dung itself. To neglect so valuable a source of manure, is neglecting a mine of gold and silver which may be worked at

command. Under this management, the arable land would have the self-same dung it now has; while the grassland would have an annual supply of riches, which now run waste in the shores and rivulets.

But before a dung-yard can with propriety be bottomed with mould, the bottom of the yard itself ought to be properly FORMED. A part of it situated conveniently for carriages to come at, and low enough to receive the entire drainage of the stable, cattle-stalls, and hog-flies, should be hollowed out in the manner of an artificial Drinking-pool, with a rim somewhat rising, and with covered drains laid into it from the various sources of liquid manure.

During the summer months, at leisure-times, and embracing opportunities of back-carriage, fill the hollow nearly full with mould,—such as the scowerings of ditches, the shovelings of roads, the maiden earth of lanes and waste corners, the coping of stone-quarries, &c. &c.—leaving the surface somewhat dished; and within this dish set the dung-pile, carefully keeping up a rim of
mould

mould round the base of the pile higher than the adjoining surface of the yard; equally to prevent extraneous water from finding its way into the reservoir, and to prevent the escape of that which falls within its circuit.

26.

M A R K E T S.

CATTLE AND SHEEP are mostly fold in the MARKET-TOWNS of the Vale. WHITBY and SCARBOROUGH take the surplus of such as are fit for the butcher; and those which are lean are bought up by the SOUTH-COUNTRY DROVERS. MALTON is the principal market for *horses, corn, butter, and bacon*. *Oats*, ordinary butter and bacon find a market in the manufacturing District of WEST-YORKSHIRE: prime butter, and some bacon, travel by way of Hull to the METROPOLIS. Horses are divided between the LONDON and FOREIGN MARKETS.

An evil, which has been long growing in the markets of this kingdom, has here got to a height which entitles it to notice.

GOLD cannot here be any longer called the medium of property. Let a man sell his whole stock at market, and it is chance if he bring home more than three or four guineas. The remainder of the value received is PAPER ;—not bank-notes,—but paper of no other value than that which is given it by the engraver, and the name perhaps of some shopkeeper, or other petty banker, wholly unknown to the farmer ; who is, perhaps, entirely ignorant as to whether the name or names be real or fictitious.

One *accident* has already happened in this neighbourhood ; and it is matter of astonishment that more do not follow : a circumstance which can only be accounted for by the *profits* which this species of coiners receive*.

An

* Not only by the interest of the amount of bills in circulation ; but by *dead notes* ; that is, bills lost and destroyed by accident ; the amount of which is clear gain.

An arch cobler of Newcastle upon Tyne has made a fortune by coining penny and twopenny notes †, which are highly embellished, and rendered valuable by a long list of respectable names; his friend *Crispin* at the head of them. They are also payable in London, at a *house of names* equally respectable and responsible; the finest burlesque upon modern banking which can possibly be conceived. The fellow is said to have, already, pocketed a thousand pounds by the thought.

The *conveniency* of paper-money few men will deny; especially now when the weighing of gold is become in some degree necessary: a business extremely awkward in a market. All the *farmer* wants is *security*.

On the other hand, the *profitableness* of paper-money, to those who coin it, is still less disputable. But why shall *individuals* be suffered to batten on the public by the profits of COINAGE? Why shall one man be
dragged

† Circulated among the colliers, keelmen and sailors; every one being proud to have a "bank note" in his pocket.

dragged to the gallows for coining sixpences and shillings, while others are suffered to amass fortunes by coining five and ten pound pieces?—*If paper-money be political*, the NATION, not *individuals*, ought to have the profits arising from it.

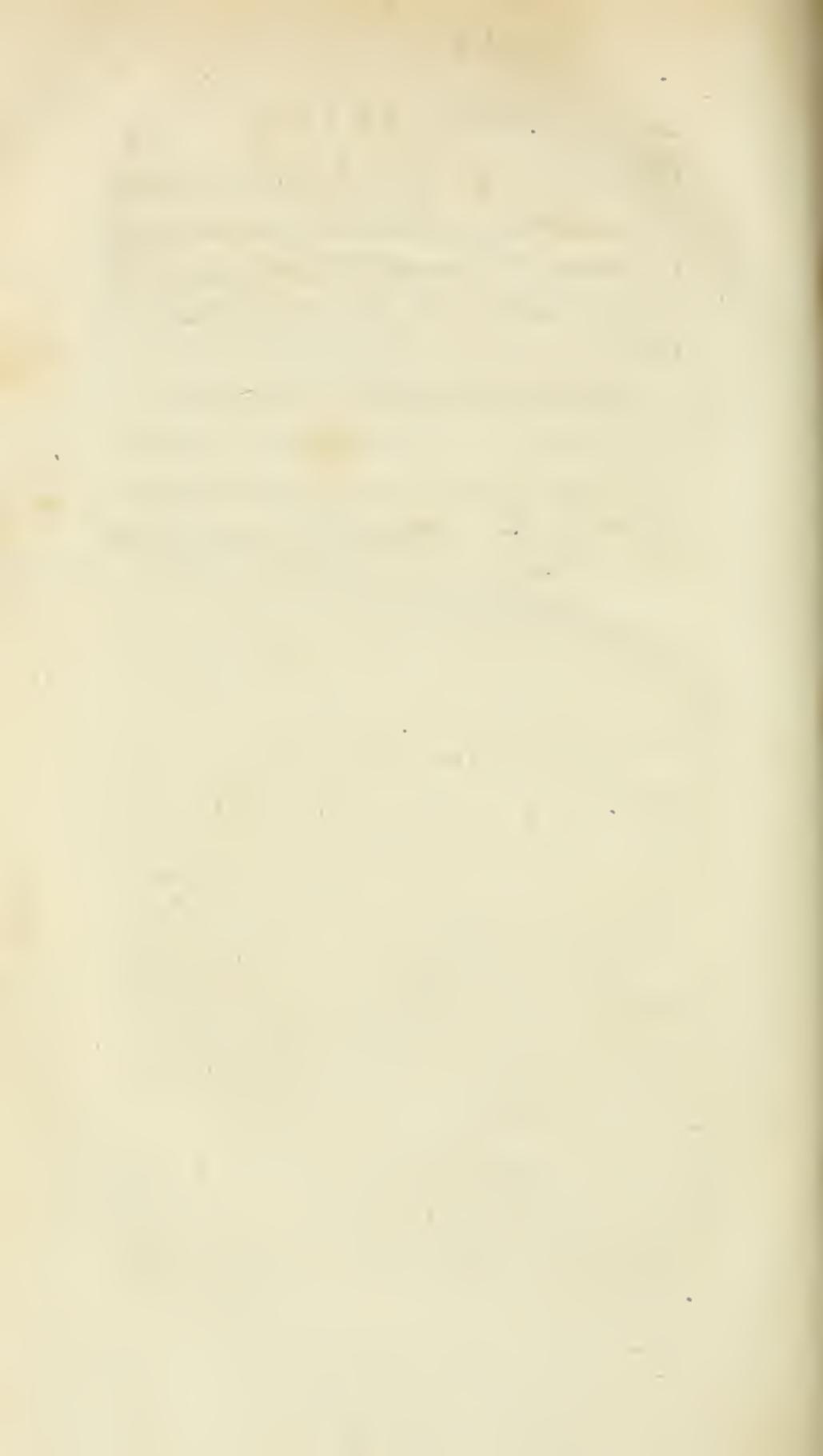
But the insecurity of paper-money, and the crime of coining it, are only part of the evil which is here meant to be held up to view. I pretend not to the profound in political arithmetic; but I have always understood that the prices of commodities at market bear a proportion to the quantity of money in circulation. If this be in truth the case, the evil here spoken of has the most pernicious tendency.

In the present state of Europe, this country can preserve its *pre-eminence as a nation* by manufactures and commerce alone. The demand for the manufactures of a given country will ever bear a proportion to their *comparative price*. The price of manufactures depends upon those of materials and labour; and *this* on the price of living. If by a flow of cash in circulation (no matter whether of gold, silver,

ver, copper, or paper) the prices of living, labour and materials be suffered to advance, the demand for manufactures will of course decline, and with it the prosperity of the nation.

I wish not to interfere officiously in concerns of Government ; but the subject under notice seems to be sufficiently connected with RURAL ECONOMICS to warrant its being mentioned in this place.

END OF THE FIRST VOLUME.







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